AMERICAN AGRICULTURIST

FOR THE

Farm, Garden, and Household.

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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CLEARING UP A FARM.—DRAWN BY R. E. ROBINSON.—*Engraved for the American Agriculturist.*

The history of the first century of the settlement of this country is one of forest-felling and land-clearing. The labors, trials, and hardships of those who in early days engaged in a struggle with the wilderness can only be appreciated by those who have made or are now making for themselves and their families a home in the wild, wooded regions still unoccupied. To go into the woods and "clear up" a farm is no easy task; and the scene which is presented in the engraving will carry the thoughts of many of our middle aged readers back to the days of the hardest work of their lives, but days that were bright in the hopes of future comfort and prosperity. Before the corn and wheat could grow, or the green pasture furnish food for the stock in summer, and the meadow its burden of hay for the winter, the trees must be felled, the tangled brush be burned, the virgin soil broken, and the seed sown in the rough, but rich and willing ground. All this demanded toil, and toil of the most severe kind. But what changes were wrought! Every tree brought down opened a new space on the ground below, and a new inlet for the sunlight above; every stump or every stroke of the axe was an encouragement for the next. Look now at the aggregate results of this labor. A wild, savage country transformed into a peaceful, prosperous land of plenty. In some cases the change was slow, and several years elapsed before the land was thoroughly subdued to cultivation; but often the transformation has been so sudden as to almost make one doubt his senses. In the space of a few short months the unbroken forest, known only to the Indian in pursuit of his game, was changed into open fields of waving grain. The wonderful story of the changes that accompanied the progress of the settlement of our forest regions, seems like fiction to him who has always lived in a long settled or prairie country. But to one who returns after a few years absence from the forest-side home of his boyhood days, the change is real. The woods have been swept away as by a whirlwind, and the picture that he has long held so dear in his memory, no longer exists in reality. The land has been "cleared up" and even the stumps of the old trees have yielded to slow decay or the more rapid blasting dynamite, and the mower and reaper run smoothly over the ground. Year by year the "wood lots" have been narrowed in, until they are now in many cases too small to furnish the proper protection from stormy winds to the wide open stretches of country, or against other sudden, violent meteorological changes. The desire to get all the acres into grain and grass has been too strong, and the results are not to the country's advantage. We may from necessity be called upon to restore by the slow process of plant-growth what has been destroyed as by fire.

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Bee Plants.—"J. F. Z.," Isanti Co., Minn. But little has been done in this country in the way of growing plants expressly to furnish pasturage to bees. One of the strongest claims that bee-keeping has upon farmers is, that it utilizes that which would otherwise go to waste. To devote land and the labor of raising plants to the bees would put the business upon a very different footing, whether it would be profitable or not remains to be tested. In a conversation with the late Mr. Quinby on this subject, he stated that the plant which seemed to him the most promising for cultivation was the common Catnip. This is a perennial, and a field once stocked would remain for several years; it blooms in summer when other honey-flowers are scarce, and it is said that the product is very white and of great delicacy of flavor.

Calendar for April, 1880.

Day of Month.	Day of Week.	Boston, N. England, N. York State, Michigan, Wisconsin, Iowa, and Oregon. Sun rises.	Sun sets.	Moon rises.	N. Y. City, Ct., Philadelphia, New Jersey, Penn., Ohio, Indiana, and Illinois. Sun rises.	Sun sets.	Moon rises.	Washington, Maryland, Virginia, Kentucky, Missouri, and California. Sun rises.	Sun sets.	Moon rises.
		H. M	H. M	H. M.	H. M	H. M	H. M.	H. M	H. M	H. M.
1	T	5 42	6 26	0 53	5 43	6 25	0 47	5 44	6 23	0 41
2	F	5 41	6 27	1 42	5 42	6 26	1 37	5 43	6 24	1 32
3	S	5 39	6 28	2 24	5 40	6 27	2 19	5 41	6 25	2 14
4	S	5 37	6 29	2 59	5 38	6 28	2 53	5 40	6 26	2 49
5	M	5 35	6 30	3 25	5 37	6 29	3 25	5 38	6 27	3 21
6	T	5 34	6 31	3 50	5 35	6 30	3 49	5 37	6 28	3 49
7	W	5 32	6 32	4 14	5 34	6 31	4 14	5 35	6 29	4 16
8	T	5 30	6 33	4 38	5 32	6 32	4 39	5 34	6 30	4 41
9	F	5 29	6 35	sets	5 30	6 33	sets	5 32	6 31	sets
10	S	5 27	6 36	8 5	5 29	6 34	8 2	5 31	6 32	7 58
11	S	5 25	6 37	9 8	5 27	6 35	9 5	5 29	6 33	8 58
12	M	5 24	6 38	10 6	5 26	6 36	10 1	5 28	6 34	9 55
13	T	5 22	6 39	11 1	5 24	6 37	11 55	5 26	6 35	10 49
14	W	5 20	6 40	11 49	5 23	6 38	11 41	5 25	6 36	11 38
15	T	5 19	6 41	morn	5 21	6 39	morn	5 23	6 37	morn
16	F	5 17	6 42	0 32	5 19	6 40	0 27	5 22	6 38	0 21
17	S	5 16	6 44	1 9	5 18	6 41	1 4	5 20	6 39	1 0
18	S	5 14	6 45	1 40	5 16	6 42	1 37	5 19	6 40	1 33
19	M	5 12	6 46	2 9	5 15	6 43	2 6	5 18	6 41	2 4
20	T	5 11	6 47	2 35	5 13	6 44	2 31	5 16	6 42	2 32
21	W	5 9	6 48	3 0	5 12	6 45	3 0	5 15	6 42	3 0
22	T	5 8	6 49	3 25	5 11	6 46	3 35	5 13	6 43	3 28
23	F	5 6	6 50	3 53	5 9	6 47	3 58	5 12	6 44	3 58
24	S	5 5	6 51	rises	5 8	6 48	rises	5 11	6 45	rises
25	S	5 3	6 52	8 21	5 6	6 49	8 16	5 9	6 46	8 11
26	M	5 2	6 54	9 35	5 5	6 51	9 30	5 7	6 47	9 24
27	T	5 0	6 55	10 42	5 4	6 52	10 36	5 6	6 48	10 30
28	W	4 59	6 56	11 37	5 2	6 53	11 32	5 5	6 49	11 26
29	T	4 58	6 57	morn	5 1	6 54	morn	5 4	6 50	morn
30	F	4 56	6 58	0 22	5 0	6 55	0 18	5 3	6 51	0 14

PHASES OF THE MOON.

MOON.	BOSTON.		N. YORK.		WASH'N.		CHA'STON		CHICAGO.	
	D.	H. M.	H. M.		H. M.		H. M		H. M.	
3d Quart.	2	1 29	mo.	1 17	mo.	1 5	mo	0 53	mo.	0 23 mo.
New M'n	9	10 23	mo.	10 11	mo.	9 59	mo	9 47	mo.	9 17 mo.
1st Quart	17	2 30	ev.	2 18	ev.	2 6	ev.	1 54	ev	1 24 ev.
Full M'n	24	6 6	ev.	5 54	ev.	5 42	ev.	5 30	ev.	5 0 ev.

AMERICAN AGRICULTURIST.

NEW YORK, APRIL, 1880.

Hints for the Work of the Month.

[*The Hints and Suggestions in these columns are never copied from previous years, but are freshly prepared for every month, from the latest experience and observations, by practical men in each department.*]

Spring work comes without hurry to the farmer who is prepared. Much of the mischief laid to unfavorable seasons rightly belongs to a laggard beginning. A well started crop rarely fails to be satisfactory in spite of weather, and a late one is rarely so.

Early Planting and Sowing.—With the soil well prepared, early sowing is most desirable with many crops. Some tender ones make a poor start unless the ground is warmed by the sun and air, and a late frost *may* do harm. But it is rarely wise to delay because of what *may* happen, when promptness promises the best results.

The Condition of the Soil is always to be taken into account. Fields that are drained, either naturally or artificially, may be safely sown when a wet soil cannot be. Wet soils are cold. Some deny this, on the ground that the water is as warm as the soil, and has no refrigerating effect. But it is the circulation of air in the soil that warms it, and if it is so filled with water that air cannot enter, it remains cold, until the water has evaporated.

The First Crop to be Sown, is spring wheat, then oats; after these come beets and potatoes. Wherever spring wheat will succeed it is a desirable crop, even when sown in April. Out of its natural district, which is marked out by peculiarity of climate more than any other condition, it is of no use to sow it, unless in a small way to experiment with new varieties of unusual promise.

Barley.—A fine condition of the soil is indispensable for this crop. Old barley growers know all about this, but many want to grow barley because it is a profitable crop when successful. It will succeed in any good, well prepared soil, but a mellow clay loam which can be brought to good tilth is to be preferred. But good crops of bright grain may be grown on lighter loams if in good heart. It may be made an excellent soiling crop to follow clover, and as a change from oats. We prefer to sow thickly, say 2½ bushels per acre, but opinions vary in this respect, and from 1½ to 2½ bushels is the range.

Oats.—Early sown oats in our hot climate are, as a rule, better than the late sown. Our climate is not so favorable for oats as the cooler northern and northeastern ones. There oats are heavy and plump, and seed from Canada, Nova Scotia, and New Brunswick will produce well for two or three years. By using seed from these northern localities, oats may be grown in the Middle States weighing from 35 to 45 lbs. per bushel.

Flax.—It is supposed that flax is a "hard" crop on land. It is true in one sense, but it will not injure a cool, moist soil that has a fair proportion of vegetable matter in it. It has been grown with oats and threshed for feeding, and there are few more profitable crops than this mixed one. A large demand is springing up for both seed and fibre. Mills are becoming numerous. But it should not be lost sight of that mills will not come until there is some material to be worked up, and if the farmers of any locality wish for a factory near them, they must first grow the needed material. It is fortunate that flax can be grown for feed, and even the straw used for fodder when mixed with oats, so that a good foundation may be laid for a supply for flax mills. The same is true of

Sugar Beets.—After many years of trial and failures, the manufacture of beet sugar promises to become successful. It depends wholly on the farmers. To retain in our midst the millions of dollars sent abroad for sugar, is desirable. The Portland, Me., Sugar Factory Company, after several seasons of work, still perseveres in inducing the Maine farmers to produce roots, and is sanguine of success. Beets can be grown profitably if a determined attempt is made. Let but one acre, or less, be planted and well tended, and as soon as that can be grown successfully, 10 acres may be.

Plant Early.—Beets need to be put in very early. The seed should go in the ground immediately after the last harrowing, and if the seed be soaked to ensure quick germination, the young plants will get a start of the weeds. The writer's practice has been to do this with all kinds of roots, and as soon as the green line of the plants can be seen, to run down the rows with a hand cultivator that cuts on both sides of each row, and stirs the ground within an inch of the small seedlings. By keeping the plants cultivated in this way the middles may be left without harm for some time, as the rows are kept distinct, and can be readily seen when the horse hoe is used.

Plant by Hand.—Steeped seed cannot well be sown by a machine; by steeping, the quality of the seed is discovered. A light furrow may be made and the seed dropped in it so closely as to consume 6 or 8 lbs. of seed per acre. The rows may be covered by the hoe or by a roller run over the ground across the rows.

Fertilizers.—No other crop requires a more vigorous start than roots. A liberal application, at planting, of artificial fertilizer, Peruvian guano or special root manure being preferable, will go a great way to ensure success. It is well to scatter the root manure along the rows as they are opened, drop the seed and then cover. This prevents too close contact of seed and fertilizer which is often dangerous. Guano needs to be more thoroughly mixed with the soil.

Corn.—This is one of those crops which require a warm soil and which suffer from a late frost. But the ground may be prepared in season to help on the planting afterwards. As good a crop may be grown on stubble as on sod if the right method is followed; and this is simply to give sufficient manure and thorough cultivation. 100 *bushels per acre* may be produced, and this means double or treble pay for the same labor. Far larger crops than this have been grown, and of late years, thanks to the general diffusion of scientific knowledge through the best of the agricultural journals, the average yield of this grain has been doubled. A yield of 75 or 80 bushels is now secured where 30 or 40 bushels used to satisfy farmers. The use of fertilizers and good methods of cultivation have effected this; but the same means may be made available for even larger yields, and one should never stay satisfied with a large crop, but try for

still greater ones. The time of planting of course varies with the latitude, and these remarks apply when corn-planting is in season.

Grass.—With a doubled yield of corn and productive crops of roots, more land can be laid down to grass. The cheapest and the most essential product of the soil is grass. The better the system of agriculture the better will be the grass produced. Orchard grass for dry soils, and Red-top for low land are now thought more of than heretofore. A study of the character and value of the best grasses and their cultivation and protection is now of great importance. "Flint's Grasses and Forage Crops" is a useful book for this purpose.

Seeding to Clover.—Clover seed sown this month will do well in many localities, if scattered upon ground previously harrowed with a smoothing harrow, which passes over the grain without injury, and fertilized with a light top-dressing of fertilizer.

Soiling Crops.—The first cutting of green fodder is winter rye, that which is first cut will make a second growth that can be cut in June. An early sowing of oats, oats and peas, or oats and barley, should be made this month for cutting after clover. Soiling crops are sown in succession weekly, so as to have succulent fodder continuously.

Potatoes.—As the old favorites, the Peach Blow, Mercer, and others, gradually failed and run out, so our newer favorite, Early Rose, seems doomed, as a field crop. Unfortunately we cannot as yet lay our hands upon a perfect substitute. Some promising new varieties are offered which are worthy of trial. One of them is mentioned on page 148. As a rule seed procured from a northern locality yields better than home grown seed.

Live Stock.—The coat is now changed and good brushing or carding helps the shedding of the hair by stimulating the skin.

Medicines are to be avoided as a rule, excepting in extreme cases. "Spring physicing" is an old notion which should rest with our ancestors. If due attention has been given to feeding and general care, stock will come out in good order after their season of dry feeding and confinement

Horses.—When hard work commences, dry food will be needed. It hardens the muscles and prevents excessive perspiration. The skin, tender from long rest, is easily chafed and galled. Cold water and Veterinary Cosmoline will keep galls in check and heal raw spots. Clean, soft harness, prevents galls. Shoes that have been long on ought to be removed, and in paring the hoof let no knife touch the frog. It will wear away fast enough.

Cows.—Garget and abortion trouble the dairymen. We believe in prevention. The former may surely be prevented by due care. As soon as the udder contains milk, it should be relieved by drawing off a part of it, if there is any tendency to hardness. These diseases are often a consequence of weakness. A fat animal may be weak for want of food. When a cow's time approaches and the feed is suddenly reduced, disturbance of the system is caused. Circulation becomes irregular, and congestion occurs in the most susceptible organs. The udder is the principal one of these at this period, and an attack of garget is very sure to occur. This may not always be so, but long experience and observation convinces us that it generally is. The remedy is obvious.

Sheep and Lambs.—As lambs grow and thrive, ewes suffer. All the growth of the lamb comes from the ewe. The suggestion should carry its own moral, viz., *feed the ewe.* There is no food so nourishing for a lamb as the dam's milk, and plenty of it produces the finest lambs. Cow's milk may do for a store lamb, but not for a market lamb. Ticks will become troublesome and fret the flock. The use of a strong decoction of Tobacco will destroy these pests.

Swine.—Corn is high, but so is freight, and as 800 lbs. of corn may be carried in a pork barrel, it is a question if it will not pay to feed 50 cent corn to 4 cent pigs. Every bushel of corn fed relieves the market of a surplus, and makes the remainder more salable. This is to be considered. Also the fact that there is *a* kind of pig that may be fed the most profitably and that one kind is the one to discover and choose. Hereafter farmers will *save* their profits in all probability, just as is done in other manufacturing business. Animals are living farm machines.

Poultry.—Vermin run riot among the poultry and many poor fowls die of diseases caused by the constant worriment of lice and fleas. As the weather grows warm this is to be looked after, and the flock freed from the pests. Free use of kerosene oil or crude petroleum, about the roosts and crevices of the nests, and clean earth in the runs and houses will effect a deliverance.

Machinery.—After the winter's rest an overhauling of the machines will be proper. Dust and rust should be cleaned off, and oil and tallow used liberally. It should be understood that there is more wear from rust than from use, with farm machinery.

Notes on Orchard and Garden Work.

Orchard and Nursery.

Whoever sets out an orchard of course does it with the expectation of a return in fruit. No one plants corn or potatoes without first considering if the land will give him a crop; if the soil is not in the proper condition he knows that he must make it so, or lose his seed and his labor. Much less than corn and potatoes can fruit trees make a crop on nothing. The trees will struggle along, do the best they can, but such orchards do not pay, and "run out" early. Unless the land is sufficiently fertile for an ordinary farm crop, it should be made so; no soil too wet for such crops will answer for fruit trees, which, to succeed, need well drained land. The plowing should be as deep as the character of the soil will allow, and the sub-soil plow may generally follow the other with benefit.

The Trees.—It is assumed that trees were ordered some time ago; they should be at hand ready for planting. It is the custom at nurseries to take up and heel-in a large stock of the kinds of trees most called for, this retards the growth, and allows them to fill late orders. If there is a nursery near at hand it will pay to make a bargain, if possible, to help dig the trees yourself, and thus secure a larger share of the roots that belong to them. If trees, in a long journey, become dry and shriveled, bury them, root and branch, in mellow earth for a few days, when they become plump again. In unpacking the trees, look to the labels, as some may become detached and would otherwise be lost.

Laying Out.—In staking out the ground take care to have the trees in true rows. Put all of the same variety together, and if there are many kinds make a planting chart showing the position of each.

Preparing the Trees.—Everybody wishes to get all he can for the money, and the nurserymen send much larger tops to the trees than the pruned roots in their new positions can support. It is safe to shorten the branches one-third or one-half, but it should be done with judgment and reference to the condition of the roots. At the same time pare smooth any broken or mangled roots.

Planting.—In setting a tree take time to do it properly; spread the roots evenly and to their full length, and so work in the soil among them that there will be no hollow places. Water may be used to carry the soil among the roots—not dashed in by the pailful, but showered from a watering-pot. Do not stamp the soil down around the roots, but firm it carefully with the foot. The tree should be set no deeper than it stood in the nursery.

Crops.—The soil of a young orchard may be kept in cultivation until the trees begin to bear; grain should never be grown, except Indian corn, but potatoes and root-crops are the best.

Grafting.—A tree that is of a poor or worthless sort should be renovated by grafting. This can be done this month; for full particulars with illustrations of the process see the February number.

Cions should have been cut early, but may be secured until the buds start. Many nurserymen cut a stock of cions of all the leading varieties in advance, and can supply them by mail or otherwise.

Root-Grafts.—Those who would start an orchard at a very small outlay, can begin with root-grafts. These are roots in which grafts are set; the work is done in the winter and the grafted roots kept in boxes of earth until they can be set out in spring. Many nurserymen offer these for sale, and they are the cheapest form in which trees can be bought. They are to be set 2 feet apart, in rows distant enough to work with a cultivator, and put in with a dibble so deep that only the top bud is above ground. Keep them well cultivated, and 90 per cent, or more, should be thrifty young trees in autumn. In 2 or 4 years, according to the variety, they will be large enough to set in the orchard.

Insects.—Destroy the eggs of the Tent Caterpillar, which are to be found in small closely fitting rings or bands near the ends of the smaller twigs, and may be cut away. Many insects harbor beneath the loose bark of trees, and by scraping this off and washing the trunk and limbs with a solution of soft soap, much good may be done. To prevent the ascent of the wingless females of the Canker Worm, use heavy brown paper bound closely around the tree's trunk, and then smear with cheap printer's ink or tar. The bands will have to be re-coated at frequent intervals through the season.

Fruit Garden.

Those having the planting of small fruits still to do, will find hints in last month's Notes.

Currants and Gooseberries.—Prune at once any that have been omitted; abundant manuring and mulching will increase the size of the crop and the fruit. So soon as the leaves are of much size the "worms" may be expected. Examine the under surface of the lower leaves for the eggs, and destroy all that are found. When holes are seen in the leaves apply White Hellebore, either sprinkled dry or mixed in water, a tablespoonful or so to a pailful of water. It is better to first scald the Hellebore with a little boiling water before adding it to the pail containing the cold water. Keep stirred.

Strawberries receive treatment on page 149.

Grapes.—Vines can still be planted and should be set out by all who have a spare corner on the place, as along a fence, or by the side of a shed. Under ordinary care a few vines will give an abundance of nice fruit in its season, and every farmer should feel that he has a place for a few grape vines. See the article on page 149.

Kitchen and Market Garden.

Cold Frames.—The plants from these are to be set out so soon as the soil is ready, and the sashes used on other frames to push forward a crop of lettuce, which latter, when out of the way, is to be followed by cucumbers—thus making the most out of the investment in glass. At this season the frames should have an abundance of fresh air, and while generally open during the day, they must be shut at night and in cold days.

Window Boxes may be placed out of doors on warm days to harden off plants; they may be left out overnight when not cold enough to chill them.

Sowing Seeds.—The plants of the vegetable garden are divided into two general classes, *hardy* and *tender.* For a list of each and their treatment, see last month's Notes.

A Marker can be easily made from a piece of scantling for the head piece into which the handles and pegs are fastened. The pegs may be 9 inches apart on one side and 12 on the other. A line is used as a guide in making the first rows, after which, by allowing the outside peg to run in an old mark, all the rows may be straight.

Greens were so fully treated last month, page 104, that it need only be referred to here.

Asparagus.—The old ideas about the elaborate preparation for an asparagus bed are out of date; it is as easy to make a bed for asparagus as almost any other plant, and nothing pays any better for the little trouble. Set the new beds so soon as the plants can be had, giving it a generous manuring, and putting the crowns about four inches below the surface. Rows 2 feet apart, with a foot between the plants, is a good distance for the family garden, but if room can be spared the distance may be increased. Let the plants grow until the third year

before cutting. The coarse litter should be raked from the old bed, to make it smooth and clean, before the stems begin to come through the ground.

Early Potatoes should be put into the ground at the earliest possible date. When started in boxes they may be greatly hastened; in planting take care that the tender sprouts are not broken off. The soil should be light and warm for early potatoes.

Sweet Potatoes.—The time for setting in the latitude of New York City is about June 1st, and the roots should be put in the hot-beds for starting at least six weeks previous to this. The soil of the hot-bed need not be rich, but light and loose, and well warmed. Nothing is gained by putting this sub-tropical plant in open ground until it is warm.

Cabbages.—Sow seeds in hot beds for medium crop; the plants from the cold frame will supply the early crop.

Corn is one of the *tender* plants, and should not be put in the ground until there is settled weather and warm soil for it. "Corn-planting time" varies with the locality, and good judgment must decide.

Peas.—See "Peas in Plenty," in the March number. Sow "Daniel O'Rourke" and "Alpha" for early, and the "Champion of England" for late; the "Champion" needs tall brush to do its best.

Succession Crops.—Beets, Radishes, Peas, etc., should be sown at intervals of two weeks or so, that there may be a succession of fresh "pickings" or "pullings" through the season.

Odds and Ends.—Try a few *new* varieties for the pleasure and possible profit that they may bring; but do not go into novelties largely....Keep the garden perfectly clean of weeds at the start as a weapon in the struggle against the enemy. Nothing does better execution than a heavy rake with long, sharp teeth, but it must be used early and often. Weeds that can not be killed by this are all too large.

Flower Garden and Lawn.

Under this heading are included the various hints for the ornamentation of the grounds around the house—the *front yard* as it is generally called—with its trees, shrubs, beds, and paths, and above all the

Lawn.—Nothing is more pleasing than an expanse of smooth, rich, green, nicely kept grass. The lawn should be one of the features of every pleasure ground, no matter how limited in extent, and in laying out the walks and drives they should not divide the lawn more than can be helped. In making a lawn the soil should be first thoroughly manured after which, for heavy soils, Kentucky Blue Grass seed should be sown in abundance; for light soils Red-Top is best. It is well to sow the seed in two or more directions, thus securing a more even distribution, and therefore a better turf.

Walk and Drives.—As far as possible in laying out walks let them take a direction that all will be inclined to follow, that there may be no cross-cut "sheep-paths." The walks will need to be raked, smoothed and rolled. In constructing new ones and drives make a solid foundation of coarse stones with smaller ones above. Thoroughness in the making of a walk or drive will always pay. A good walk is a comfort while a poor one is always a source of annoyance to the owner and all others.

Trees.—The tendency is to plant too thickly. Young trees make but little showing at first, and over-planting is natural. For the health of the family no trees should be planted so close to the house as to exclude the light and sunshine. In planting do not copy a neighbor and thus create sameness. Do not plant large forest trees in a small yard, but select those of medium size, and attractive for flowers as well as foliage. The varieties are almost innumerable; and those from our own woods and thickets are, many times, as good as the best.

Shrubs planted in clumps are very useful in concealing boundary lines and giving a pleasing effect to the grounds. A well formed shrub standing alone is often very beautiful.

Annuals.—All hardy annuals, Rocket Larkspurs, Stocks, Pansies, and the like are to be sown as soon as the beds can be made ready. The tender ones, such as Balsams, China Asters, etc., may be sown in hot-bed or window-boxes.

Hardy Perennials.—Old clumps are to be taken up and divided, and it is better to reset in fresh soil.

Greenhouse and Window Plants.

At this season the plants indoors are apt to be neglected from the press of work outside, and at just the time when they demand special care. The change of the season with its increase of heat makes the insects more abundant, and vigilance now is the price of clean plants through the summer.

Shade will now be required by some plants, and it can be provided by coating the glass with lime-wash, adding to the thickness as the heat increases.

Hardening off, or the tempering of the house-grown plants to the open air must be gradual.

Summer Bloom.—The greenhouse should not be stripped but made attractive through the season by blooming plants like Gesnerias, Fuchsias, etc.; sow Balsams and other annuals for pot culture.

Commercial Matters—Market Prices.

The following condensed, comprehensive tables, carefully prepared specially for the *American Agriculturist*, from our record kept daily during the year, show at a glance the transactions *for the month ending March 10th*, 1880, and for the corresponding period last year:

1. TRANSACTIONS AT THE NEW YORK MARKETS.

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats*
24 d's *this* m'th	368,000	1,251,000	2,137,000	41,000	409,000	896,000
24 d's *last* m'th	453,000	1,715,000	1,904,000	84,000	289,000	1,054,000
SALES.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
24 d's *this* m'th	305,000	24,100,000*	4,113,000*	285,000	194,000	1,314,000*
24 d's *last* m'th	321,000	23,226,000*	3,807,000*	118,000	237,000	1,019,000*

* Including sales for forward delivery.

2. *Comparison with same period at this time last year.*

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
24 days 1880	368,000	1,251,000	2,137,000	41,000	409,000	896,000
23 days 1879	359,000	3,215,000	2,119,000	97,000	226,000	409,000
SALES.	*Flour.*	*Wheat.*	*Corn*	*Rye.*	*Barley.*	*Oats.*
24 days 1880	305,000	24,100,000	4,113,000	285,000	194,000	1,314,000
23 days 1879	378,000	8,103,000	4,307,000	372,000	263,000	1,093,000

3. *Stock of grain in store at New York.*

	Wheat. bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Malt.* bush
Mar. 9, 1880	4,411,800	256,400	173,050	456,700	186,650	131,450
Mar. 10, 1879	3,029,051	1,363,672	416,075	696,625	600,750	52,853
Mar. 11, 1878	1,639,371	460,454	114,200	660,145	1,090,851	275,705
Mar. 12, 1877	2,646,287	1,517,208	284,607	475,671	769,451	327,659

4. *Exports from New York, Jan. 1 to March 10.*

	Flour. bbls.	*Wheat.* bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Peas.* bush.
1880	701,000	5,227,000	4,805,000	358,600	127,000	29,000	71,000
1879	563,000	6,981,000	5,793,000	712,000	37,217	38,500	101,000
1878	475,400	7,483,409	2,776,780	339,829	621,599	31,847	55,550
1877	254,958	1,576,839	2,078,553	164,389	95,457	29,338	124,827
1876	357,715	1,910,068	2,630,925	15,387	—	46,266	198,153

Since our last Review, Stock Exchange operations have been on a liberal scale, and prices of nearly all classes of securities have been on the advance, though, under a more urgent demand for accommodation, Money has been ruling higher on call, and in the discount line. Real Estate has been gaining in favor, steadily, and, under increasing purchases, the tendency of values has been upward. Dry Goods, Boots and Shoes, and Hardware have been quite active, and generally strong in price. Drugs, Dyes, Chemicals, Naval Stores, Petroleum, Tobacco, Rice, Hemp, Fish, Hops, Coffee, and Teas, have been moderately sought after, and have been variable, though the changes, in most instances, have been unimportant. ....Hay and Straw have been less freely dealt in, and closed rather easier. Metals have been less active, and quoted lower, and somewhat unsettled.....Hides have been attracting more attention, leaving off stronger. Leather has further receded in price, on more liberal offerings, leading to increased activity.....Sugar and Molasses have been advanced, on reduced supplies, and a livelier trade inquiry.....A comparatively brisk business has been reported in Cotton, chiefly in the speculative line, at, however, irregular figures....More demands have been reported for Seeds, especially for Clover, which has been wanted by the home-trade, and has been quoted firmer.....Wool has been in materially reduced stock, and active request at hardening prices. London Public Sale results favorable to holders..... A fair degree of animation has been apparent in Provisions, which have fluctuated considerably in price, leaving off more steadily.....In the Breadstuff line, business has been generally quite brisk for the season—notably so in Grain, largely on speculative account, at very variable figures—Flour, Wheat, and Oats closing depressed, lower, and irregular; Corn, for early delivery, cheaper; Rye and Barley about steady. Export purchases of Flour have been recently on a limited scale. Wheat has been taken to a fair aggregate by shippers—particularly No. 2 Red, and No. 1 White—the favorites are the Winter grades, but the latest dealings indicated a downward tendency, as influenced by the favorable crop and weather reports, the adverse tenor of the foreign markets by cable; and the more urgent offerings. Spring Wheat, as having been in light stock and under strong control, has suffered least, but has been without much life as to actual trading. Buckwheat has been taken to the extent of about 5,000 bushels for shipment—mainly to Antwerp—at from 55c. @60c., closing at 55c. per bushel. These export purchases were the first reported in our market, and were more or less experimental. About 75 tons went to Bristol, chiefly to be there sold for feeding purposes—partly, it has been stated, for Pheasants. The home trade in Buckwheat and Buckwheat Flour is about closed for the season, which, in this connection, has not been deemed a satisfactory one. The stocks of grain in store in New York harbor are diminishing rapidly. The visible supplies of Wheat,—embracing the hoards at lake ports, in transit, and on the seaboard—at latest dates, embraced about 28,035,000 bushels;—of Corn, 15,621,200 bushels; of Rye, 900,000 bushels; of Barley, 3,687,200 bushels, and of Oats, 2,909,700 bushels, against on January 31, an aggregate of 30,100,000 bushels Wheat, 13,100,000 bushels Corn, 979,000 bushels Rye, 4,155,000 bushels Barley, and 3,080,000 bushels Oats. Ocean grain freights have rallied perceptibly and more active, business closing by steam to Liverpool, 5*d.* per bushel; to Bristol, by steam, to 5@5½*d.* per bushel; to Antwerp, by steam, to 6@6½*d.* per bushel, and by sail to Cork, for orders, 4*s.* per quarter of 480 lbs.

CURRENT WHOLESALE PRICES.

	Feb. 10.		Mar. 13.	
FLOUR—Super to Extra State	$4 60	@ 5 57	$4 65	@ 5 75
" Super to Extra South'n.	4 60	@ 8 25	4 65	@ 8 25
" Extra Genesee	5 75	@ 7 00	5 75	@ 7 00
" Superfine Western	4 60	@ 5 25	4 65	@ 5 30
" Extra Western	5 25	@ 9 00	5 30	@ 9 00
" " Minnesota	5 50	@ 8 75	5 50	@ 9 00
BUCKWHEAT FLOUR, ₱ 100 lbs	1 60	@ 1 90	1 80	@ 1 75
BUCKWHEAT, per bush	60	@ 62	60	@ —
RYE FLOUR, Superfine	4 60	@ 5 00	4 70	@ 5 15
CORN-MEAL	2 60	@ 3 35	2 50	@ 3 30
CORN-FLOUR, per bbl	4 00	@ 4 50	3 75	@ 4 50
OAT MEAL, ₱ bbl	4 75	@ 7 25	5 00	@ 7 00
WHEAT—All kinds of White	1 35	@ 1 46	1 35	@ 1 45
" Red and Amber	1 20	@ 1 47½	1 15	@ 1 46
" Spring	1 20	@ 1 40	1 20	@ 1 45
CORN—Yellow	58	@ 67	60	@ 68
" White	58	@ 67	60	@ 68
" Mixed	56	@ 61½	59	@ 65
OATS	46½	@ 53	46	@ 54
RYE	93	@ 95	93	@ 97½
BARLEY	55	@ 1 05	55	@ 1 05
HAY—Bale, ₱ 100 lbs	65	@ 90	65	@ 95
STRAW, ₱ 100 lbs	45	@ 1 05	45	@ 1 00
COTTON—Middlings, ₱ lb	13	@ 13¾	13¾	@ 13¾
HOPS—Crop of 1879, ₱ lb	27	@ 38	27	@ 38
" " 1878, ₱ lb	7	@ 20	7	@ 20
" olds, ₱ lb	4	@ 12	4	@ 12
FEATHERS—Live Geese, ₱ lb	40	@ 55	40	@ 55
SEED—Clover, West. & St. ₱ lb	7½	@ 10¾	7¾	@ 10½
" Timothy, ₱ bushel	2 75	@ 3 00	2 90	@ 3 05
" Flax, ₱ bushel	1 65	@ 1 90	1 75	@ 1 80
TOBACCO, Kentucky, &c., ₱ lb	3½	@ 14½	3½	@ 14½
" Seed Leaf, ₱ lb	6½	@ 40	—	@ —
WOOL—Domestic Fleece, ₱ lb	30	@ 56	32	@ 58
" Domestic, pulled, ₱ lb	17½	@ 55	19	@ 56
" California	15	@ 42	17	@ 44
TALLOW, ₱ lb	6½	@ 6¾	6¾	@ 6¾
OIL-CAKE—₱ ton	32 50	@33 50	31 50	@32 25
PORK—Mess, ₱ barrel	12 00	@12 35	11 75	@12 50
" Extra Prime, ₱ barrel	10 25	@10 50	10 00	@10 50
BEEF—Extra mess	10 75	@11 25	11 00	@12 00
LARD, in trcs. & bbls, ₱ 100 lb	7 50	@ 8 00	7 65	@ 8 05
BUTTER—State, ₱ lb	17	@ 36	18	@ 37
" Western, poor to Pry, lb	12½	@ 36	14	@ 37
CHEESE	11	@ 15	11	@ 14½
EGGS—Fresh, ₱ dozen	13	@ 20	11	@ 14½
POULTRY—Fowls, ₱ lb	7	@ 11	6	@ 13
" Chickens, ₱ lb	10	@ 13	6	@ 20
" Roosters, ₱ lb	5	@ 6	5	@ 6
Capons, ₱ lb	16	@ 20	15	@ 21
Turkeys—₱ lb	7	@ 14	8	@ 14
Geese, ₱ pair	1 00	@ 1 75	1 00	@ 1 75
Geese, ₱ lb	8	@ 12	8	@ 12
Ducks, ₱ pair	50	@ 65	50	@ 80
" ₱ lb	10	@ 14	10	@ 15
DUCKS, Wild, ₱ pair	30	@ 3 00	20	@ 2 00
PIGEONS, ₱ dozen	—	@ —	40	@ 3 25
ENGLISH SNIPE, ₱ dozen	—	@ —	4 00	@ 4 50
APPLES, ₱ barrel	1 75	@ 3 00	2 25	@ 3 25
STRAWBERRIES, new So., ₱ qt.	—	@ —	20	@ 50
POTATOES, new Bermuda, bbl	6 00	@ 7 00	5 50	@ 6 00
" ₱ bbl	75	@ 2 00	1 00	@ 2 00
" Sweet, ₱ bbl	—	@ —	2 75	@ 3 00
TOMATOES, new, W. I., pr bx	1 00	@ 1 25	50	@ 1 00
TURNIPS ₱ bbl	50	@ 75	75	@ 1 00
BEANS—₱ bushel	1 35	@ 1 80	1 35	@ 1 80
PEAS—Canada, in bond, ₱ bu	Nominal.		—	@ 85
" new, green, ₱ bag	1 75	@ 1 80	1 75	@ 1 80
" new, South'n, per crate	1 50	@ 2 50	1 00	@ 3 00
STRING BEANS, nw, Flor., p.c	3 00	@ 4 00	—	@ —
CARROTS, ₱ bbl	62½	@ 87½	75	@ 1 25
BEETS, ₱ 100 bunches	1 00	@ 1 25	1 00	@ 1 25
" new Bermuda, per crate	2 00	@ 2 25	—	@ 1 50
CABBAGES—₱ 100	4 00	@ 7 00	4 00	@ 9 00
ONIONS—₱ bbl	2 25	@ 4 75	2 75	@ 4 50
CRANBERRIES, per bbl	6 50	@ 8 75	7 00	@10 00
SQUASH, ₱ bbl	1 00	@ 2 50	1 75	@ 2 75
CELERY, per dozen bunches	1 25	@ 2 25	2 00	@ 3 00
SPINACH, ₱ bbl	—	@ —	1 25	@ 2 50

New York Live-Stock Markets.

RECEIPTS.

WEEK ENDING	*Beeves.*	*Cows.*	*Calves.*	*Sheep.*	*Swine.*
Feb. 17	11,193	201	1,026	25,794	36,627
Feb. 24	9,585	185	758	22,807	25,626
Mar. 2	9,977	219	939	21,965	29,522
Mar. 9	11,015	226	1,102	22,911	32,973
Total for 4 Weeks	41,770	831	3,825	93,477	124,748
do. *for prev. 5 Weeks*	59,566	986	5,295	161,502	171,109

	Beeves.	*Cows.*	*Calves.*	*Sheep.*	*Swine.*
Average per Week	10,442	208	956	23,369	31,187
do. do. *last Month*	11,913	197	1,059	32,300	34,222
do. do. *prev's Month*	10,877	263	1,282	25,130	29,569

Prices for beeves the past four weeks were as follows:

WEEK ENDING	*Range.*	*Larger Sales.*	*Aver.*
Feb. 17	7¼@11c¼.	8¾@10 c.	9¼c.
Feb. 24	7 @11 c.	8¾@ 9¾c.	9¾c.
Mar. 2	7¾@11¼c.	8¾@10 c.	9½c.
Mar. 9	7¾@11 c.	9 @10 c.	9¾c.

Beeves.—The second and third weeks were dull, the receipts being much below the average for the last four months. The improvement in market for the last week is very gratifying to all interested in the live stock trade. The foreign shipments have been larger, and the demands

for home consumption have somewhat advanced the prices .....**Cows.**—The supply has been liberal; the demand only fair, and the market dull throughout the month. Ohio cows sold at an average of $40....**Calves.**—There was a fair demand for good calves, the market not being overstocked. Prime Veals were advanced ¼c. per pound.....**Sheep and Lambs.**—The average receipts have been much below those of last month. Exporters have been liberal purchasers of heavy sheep, which therefore found ready sale. Prime Sheep brought 6c. Yearling Lambs, the best, sold for 8¼c....**Swine.**—The market has been quiet and steady, at $4.50 to $4.85 per 100 lbs. The receipts large early in the month, followed by a rapid decline.

The Horse Market.—The prices are low and the market dull, there being very little outside demand. A number of valuable stallions shipped for this country have either been killed or injured on the passage during heavy storms. Ordinary driving teams are selling at $200@$400; stylish coach horses with good speed even reaching $1,000@$1,500 per team.

Prices of Feed.

Cotton-seed meal,	per ton.	$30.00
Linseed-cake meal.	"	37.50
Middlings	"	24.00
Bran	"	23.00
Corn-meal	"	23.00

Prices of Fertilizers.

Nitrate of Potash (95 per cent.), per lb.	9 @9½c.
Sulphate of Potash (potash 41 per cent) per lb.	3½@4 c.
do. do. (potash 27½ per cent) per lb.	1½@1¾c.
German Potash Salts (potash 12 to 15 p.c.) p. ton.	$15.00@18.00
Muriate of Potash (potash 50 per cent), per lb.	2 @2¼c.
Nitrate of Soda, per lb.	3@3½c.
Sulphate of Ammonia (25 per cent.), per lb.	4½c.@4½c.
Dried Blood (ammonia 13 per cent) per ton	$40.00@45.00
No. 1. Peruv. Guano 10 p. ct. ammonia, standard, ₱ ton.	$55.00
do. do. Lobos, do. do. do.	46.00
do. do. guaranteed, ₱ ton, cargo K	56.00
do. do. rectified, per ton, 9,00 p. c..	65.00
Soluble Pacific Guano, ₱ ton	45.00
Excelsior Fertilizer Works, Fine Ground Raw Bone,	55.00
Mapes' Complete Manure (clay soils) per 1,000 lbs.	25.50
do. do. do. (light soils) per 1,000 lbs.	25.50
do. do. do. "A" Brand, (wheat) ₱ 1,000 lbs.	30.00
do. Bone, strictly pure, meal per ton	42.00
do. do. do. medium do.	36.00
do. do. do. dissolved do.	42.00
do. Fruit and Vine Manure do.	37.00
Stockbridge Rye Manure, per ton	45.00
" Wheat do do	45.00
" Seeding Down Manure, per ton	40.00
Bowker's Wheat Phosphate, per ton.	40.00
Baugh's Raw Bone Phosphate, per ton.	33.00
Baugh's Manure for Tobacco and Grain, per ton.	45.00
Walton, Whann & Co.'s Raw Bone Phosphate	40.00
Gypsum, Nova Scotia, ground, per ton	7.50

REMEMBER THAT
Three Months
REMAIN
For Premiums.

April, May, and June are the three months remaining, during which *any* person who wishes to obtain one or more of the useful and valuable articles offered in our Premium List (of which a copy will be sent free to any applicant not having one). They are easily secured. This has already been done by more than **25,000** persons, who during years past have tried with success the raising of Clubs of Subscribers for our paper, and availed themselves of the liberal offers of Premiums made by the Publishers.

We invite **all** our Subscribers to take hold of this work and secure a Premium while the offer is open. Specimen copies of English or German editions will be sent to any wishing to show them for this purpose.

Premium Clubs already started can be filled up. And there is plenty of time to start **new Clubs** and complete them.

Spring Work is opening, and multitudes will now feel the need of the help, the hints and suggestions given by practical men in the pages of the *American Agriculturist*. They only need some one to present the paper to them and take their Subscriptions. The Premiums will well *pay* those who do this for their trouble.

Distribution of the Carp.—Many of our readers write to enquire how they can obtain some of the valuable newly introduced Carp, the fish which was described in our January number. The Carp is being rapidly propagated in the Government ponds at Washington, and they will be distributed as fast as they are ready. The only way to obtain them, is to make application to the U. S. Fish Commissioner, through the member of Congress from the district in which the person desiring them resides, stating full particulars.

containing a great variety of Items, including many good Hints and Suggestions which we throw into smaller type and condensed form, for want of room elsewhere.

More Extra Pages are again added, to meet the demands of business men who feel the influence of the renewed activity everywhere produced by the great crops of 1879, and the return to specie payments. Though with the advance in prices, the extra cost of added pages consumes much of the income from them, we prefer this to trenching upon the reading columns which are crowded with valuable information. And further, these added pages are useful to our readers, who will find many items of needed or useful information all through the advertising pages—telling what is offered, by whom, and where, and how. As often stated, one usually gets some new idea by reading what others say and *how* they say it.

Only *Reliable business* men, those having both the *ability* and *intention* to do what they promise, are knowingly admitted to these pages, and we are happy to bring such men to the acquaintance of our wide circle of active, enterprising readers. ☞ *When corresponding with our advertisers please always inform them that you are readers of this Journal. They will thus know what you expect and what we expect of them as to prompt and liberal treatment.*

Special Features of this Number:

The usual large variety of original articles and items on many topics is given, all of which most readers will peruse. Those too busy for this, should not omit:

The articles on **Fertilizers.** The large tables, pages 136, 137, give in very condensed form, the results of a few only of the many extensive and important experiments with fertilizers during two years past, which are to be continued this year, as noted. These experiments are, perhaps, the most valuable new contribution in our country to successful soil culture. A careful study and comparison of the figures in every line of the tables will furnish useful information. It will be well for themselves and for the country, if ten thousand of our readers embrace the opportunity offered to make such experiments the coming season. The method of procuring the fertilizers is plainly stated on page 135.

The plans and hints for the Work of the Month, pages 128, 129, 130, prepared by several practical men in the different departments, including one valuable new helper, will aid the experienced as well as the novice, jog the memory, supply sundry suggestions, and answer many questions in letters from correspondents.

Swindlers are on the "boom," and have a "benefit" on pages 132-3. Some Western Towns may "see themselves as others see (them)." Subscription thieves, Census cheats, etc., are noticed.

Fences and Fencing, though partly crowded this month by the Fertilizers, will afford some suggestions.

The House Plan with full specifications, on page 138, if it does not give just the plan wanted by many, will help in providing the house that is wanted.

Sheep Growers will enjoy the illustration and descriptions of the American Merino, with the important figures from Mr. Geddes, on pages 139-40.

Dairy Matters, "Gilt-Edged Butter," "Granular Butter," etc., pages 140-1, will interest every owner of a cow.

Hints and Helps to Farmers, although not all under that title, on pages 142-3-4-5, contain many items useful to one or another.

Poultry Farming, page 145, will answer many queries from correspondents and afford suggestions to others.

The new Coleuses and Flowers, page 147, will interest all who grow flowers.

Everybody should have at least one Grape-Vine. How it can be grown and trained anywhere, etc., is set forth on page 149.

Market Gardeners and others will find new information on Lettuce Mildew, page 148.

Housekeepers will of course read what a "Delaware Housekeeper" offers; the article on Cloth Mildew, etc.

The Boys and Girls are not forgotten, as they will see for themselves.

The "Basket," on pages 131-2-3-4, and 159-60, etc., with items on a great variety of subjects will be worth delving into, and supply some bits of useful information to almost to every one.

DID IT PAY?—A True Story.—Thirty-eight years ago, two brothers settled on adjoining farms with equal advantage as to soil, markets, capital, etc., One of them subscribed for the AMERICAN AGRICULTURIST, and now and then bought a Book or two about his own business—the whole costing an average of $6 a year. His boys read and *thought* about their work, became interested in and *respected* it, and were happy in their toil, because they *had something to think about*. They grew up intelligent, and settled as good, prosperous farmers, respected and influential....The other brother (partly influenced by an economical wife) "couldn't afford papers and books" (he could afford 6 cents a day, or $20 a year, for tobacco, beer, etc.) *His* boys worked sullenly by day, and "skylarked" at night; they despised and hated their work, which for them was only exercising brute force, with little mind applied. When old enough to escape parental restraint, they quit the farm, one for this, and another for that, and *none* of them have ever amounted to any thing. He is himself a sullen, dispirited man. Six dollars a year, or even $2 a year, would have made a wonderful difference—would have changed their whole course of life. Would it have *paid?*—Reader, choose the better way. Get your neighbors to join you, and secure some books for the use of all, through the opportunity still offered in our general premium list; or in *some* way put one or more books about their business, into the hands of your sons, from time to time, and read and talk with them about your business. It will be the best investment you can make for them.

Prizes at Fairs.—The custom of offering a year's subscription to the *American Agriculturist* as an award at fairs, is increasing. Some Societies have done this for several years, and we would call the attention of those who make up the schedules to the great value of such prizes. One who is awarded a dollar or two in money, soon spends the sum and forgets all about it. If instead, he has a subscription to the *American Agriculturist*, he is reminded each month of the Fair and of his success, and each time that the paper comes it gives him a hint to prepare for the next fair, and helps to sustain his interest in the local society by reminding him of its existence. Besides this, instead of small cash prizes for articles exhibited, it would be vastly better to offer in each class books upon the subject to which the department is devoted. Poultry books for fowls, Cattle books for cattle, a Fruit book for apples, a Cook book for jellies, etc.

Manure for the Garden.—It is too often the case that the corn field gets the best manure, and the vegetable garden must put up with that which is second class. By all means give the garden the best of the heap; that which is well rotted, and that in abundance.

Plans of Dividing Farms by Fences.—Any subscriber having a 200-acre farm, or one near that size, will do us a favor by sending a rough outline sketch of his arrangement of fences, showing the size, number, and shape of the lots, position of barns, lane, etc. A farm for mixed husbandry is understood, not a one-crop one.

The Next World's Fair.—It now looks as if there would be a World's Fair held at New York in 1883. For a while there were two, if not more, committees discussing the matter of location, concerning which there was great difference of opinion, if not of interest. As it stands now, a bill has been prepared asking Congress to incorporate a Commission for the purpose of holding the Fair, thus giving it a national character, which is to be further impressed upon it by requesting the President of the United States to notify other Governments of the Exhibition. No appropriation is asked of Congress. As the Centennial Exhibition was to commemorate the Declaration of Independence, the Fair of 1883 will celebrate the 100th Anniversary of the Treaty of Peace, and of the recognition of American Independence. The capital stock will be $12,000,000, in shares of $10 each.

Worms in Peach Trees.—"L.," Waynesburgh, Pa. If your worms are those of the Peach Borer, they are not in the roots proper so much as in the trunk just at or below the surface. The borers already in the tree will come out the coming June and lay eggs for a new crop unless you dig them out, or kill them by the use of a wire. To prevent their attacks another year, bind the lower part of the trunk with stiff paper, the lower edge of which should be below the surface, and the upper edge a foot above; or make a mound of earth a foot high around the base. A few may possibly find an entrance under the paper, but they are easily discovered and killed. In the peach orchards they make a business of "worming" in spring and fall, and as they look after them regularly they do not regard the borer as a serious evil.

The Resignation of Prof. Le Doux.—The North Carolina papers inform us that Prof. A. R. Le Doux has resigned his position as chemist to the Department of Agriculture of that State, a loss which the resolutions passed by the Board show is greatly regretted by those best able to judge of the value of his labors.

American Grape Growing and Wine Making.

Is the title of a new work by Prof. George Husmann, of the Missouri State University. Some 15 years ago the grape "craze" was general, books were written, nurseries could not supply plants fast enough, new varieties were offered, vineyards planted, and fortunes were made—on paper. Suddenly, in one of those peculiar reverses that no one can explain, all came to a sudden stand-still; grape-vines could not be given away, and were one to offer a new variety he would be laughed at. But amid all this general wreck, there were a few who had faith in American grapes and American grape culture; these men by no means gave them up; they have been quietly investigating the causes of failure, devising better methods of culture, seeking out better varieties both for the table and for wine, than we have ever had before, until now grape growing is in a healthier condition, on a surer basis, and promises far better results than it has ever done. Prominent among the few who have been faithful through every adversity, and whose industry has not abated, is George Husmann, who has so long been identified with grape culture in this country, and especially with that of Missouri. So great have been the changes since the flush time referred to, especially in the way of varieties, and our knowledge of them, that much in the old literature is out of date, and so much new material has accumulated that one of the demands of returning prosperity is a new work. This Mr. Husmann has given us, and all who know anything of him or of grape culture, are aware that none is more competent. This work will be ready for distribution in a short time. The work is in three Divisions, or Parts. The First Part is devoted to a description of varieties, and includes all the valuable recent additions to the list, and describes the methods of culture that he has found most successful, as well as treating upon the insect and other enemies, and showing how to combat or avoid them. Part Second gives the experience of others in the grape-growing localities in the different sections of the country, including Texas and California, with other matters of interest. Part Third is devoted to wine-making; not an elaborate treatise, but gives such practical directions as will allow any intelligent grape grower to convert his fruit into wine. The work is illustrated with explanatory engravings, and comes as a most timely and acceptable aid to the growers of native grapes. Sent from this office on the receipt of price, $1.50.

Value of Swamp Muck.—Some time ago, we remarked that an acre of swamp muck of good quality, 3 feet deep, was actually worth $25,000. No doubt such a statement is surprising. So was the statement of Dr. Lawes of England, that a ton of bran fed to cows, returned more than its cost in manure. Swamp muck, free from sand, contains 2 per cent, or 40 lbs. of nitrogen in a ton. Nitrogen is worth in the market, 25 cents a pound. So that a ton of swamp muck is actually worth $10 for the nitrogen in it. All that is needed is to work up the muck, so as to make the nitrogen available. An acre of swamp muck 3 feet deep, contains 2,500 tons, and would require 8 months to draw out, at 10 loads a day. Few persons realize the value of the fertilizing elements of common waste matters which lie under their feet, and the innumerable tons of matter, that may be available for fertilizing purposes, and that much of the idle and neglected materials represent a vast amount of wealth.

Cocoanuts for Hanging Baskets.—The shell of the cocoanut is so hard and durable that it can serve an excellent purpose as a hanging basket for small plants. If cut across in the middle, a single shell will make two baskets; it is perhaps more artistic to remove one-third of the space of the shell and use the rest. The shell of itself is "rustic" and harmonizes with plants.

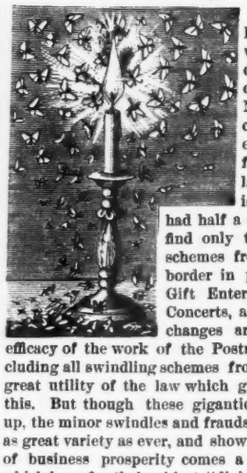
Preserving Timber.—There are several compounds used for preserving timber. The process called Kyanizing, invented by a person named Kyan, consists in saturating the timber with Bichloride of Mercury (Corrosive Sublimate). Salts of Copper have been largely employed. Creosote is now perhaps the most generally used preservative. The principle is the same in all cases: to change the albuminous matter in the wood—that part which is the most susceptible to decomposition.

Kerosene Stains upon a Floor.—A correspondent writes from Pilot Mound, Minn., that the breaking of a kerosene lamp has caused a "frightful spot" upon the floor, and wishes to know how it can be removed. Good kerosene has a boiling point at 380°, considerably above the melting point of lard—hence in order to drive it completely from any fabric, from paper, or from wood, it must be heated high enough to form a vapor, when, if pure, it may be completely removed. Heat may be applied to the floor by using flat-irons sufficiently hot, first placing a piece of paper over the spot. It may be that after the oil is driven from the surface by heat, the stain will reappear; some of the oil remaining in the wood will be brought to the surface by capillary attraction. In such a case it will be necessary to repeat the operation as often as the stain appears.

Muck Land.—"W. A. C.," Ohio, has some 20 acres of land which seems to be entirely decayed vegetable matter, and he would convert it into grass land. Though it gets very dry in summer it is probable that it is very wet in spring, and that its present condition is due to an excess of moisture. Drainage is one of the first steps in reclaiming such land. If there are large tussocks of sedge, these should be cut off, dried, and burned. After a heavy dressing of lime, at least 50 bushels grass seed may be sown with a fair prospect of success, but without drainage and lime it will do little good to sow grass upon it.

Oleo-Margarine in Iowa.—The legislature of Iowa has passed a law, that every package of bogus butter shall be stamped "Oleomargarine" in letters not less than ½ of an inch in length. Whoever violates the law must pay not less than $20 or more than $100, or go to jail for not less than ten days or both.

Sundry Humbugs.



As we look over our large monthly budget, we find two classes of documents "conspicuous by their absence." Not a single letter or circular showing how easy it is to make a fortune by stock speculation in Wall Street is here; formerly we had half a dozen daily. Then we find only two poor little lottery schemes from over the Canada border in place of the scores of Gift Enterprizes, Distributions, Concerts, and the like. These changes are indications of the efficacy of the work of the Postmaster General in excluding all swindling schemes from the mails and the great utility of the law which gives him power to do this. But though these gigantic schemes are broken up, the minor swindles and frauds seem to be present in as great variety as ever, and show that with the return of business prosperity comes a revival of those arts which have for their object "living by one's wits," or getting money without work. The scheme which appeals most directly to us is that in which some chap uses the

AMERICAN AGRICULTURIST AS A SWINDLING MEDIUM.

Complaints came from persons in Nebraska that they had not received the paper, and upon looking at our books no such names were found there. This occurring so many times, and the complaints all coming from the same part of the State, it was evident that there was something wrong. Upon inquiry it was ascertained that a person calling himself sometimes Jennings, and at others Stevens, had been about representing himself as our agent and obtaining money for subscriptions. He had a printed form for receipts, and the manner in which he signed these ought to have aroused suspicion, as they were sometimes signed "Orange & Judd" and again "Orange & Judd & Co." It should be known that

WE SEND OUT NO AGENTS

to solicit subscriptions, and that any one claiming to be such is an impostor. By our system of clubs, each one who solicits subscriptions for a club does so where he is known, and subscribers know to whom they pay their money, or can readily find out his responsibility. This chap is described as a "red-headed man" who claims to have been a Quartermaster in the army. Later a letter from the publishers of the "Nebraska Farmer," at Lincoln, informed us that apparently the same scamp had been taking subscriptions to their paper, and that they had offered a reward of $50 for his arrest. This is a form of swindling that is practised with almost every popular paper, and is one which it is beyond the power of publishers to prevent....The well known Madame Demorest, who publishes a Magazine devoted to fashions and sends out the widely celebrated

DEMOREST PATTERNS FOR DRESSES, ETC.,

is having trouble with a woman who goes about the country claiming to act as her agent and collecting money wherever she can. Madame will give $50 for the pleasure of sending her where the fashions do not change .....

A TOWN CHEATS A WIDOW.

The following is a fair sample of many like cases reported to us. We leave the names blank for those who feel guilty to fill and see how it would look with their own township standing out in capital letters in the blank:

"*To the Editor of the American Agriculturist.*

The town of —— State of —— wished to have a railway constructed to bring them near market, and which would (and did) largely increase the value of the farm products. To secure the building of the railroad the town promised aid to the amount of $50,000, or about $2 per acre. (The land afterwards increased at least $25 an acre all round.) Not wishing to pay the cash down, the town gave its Notes (Bonds) on 10 per cent interest. These were sent East, and on the plausible statement of agents, and having confidence in the character and good faith of the people of the town, the cash was paid for them, generally by widows and other poorer people, who having but little, wished to make it go as as far as they could in the returned interest. A neighbor of mine being in poor health, sold his farm, the savings of a life of hard work, and put $2,500 in these Bonds. He died soon after. His aged widow had those $2,500, in this Western Town's Bonds

AS HER WHOLE DEPENDENCE

for the rest of her days. The town, finding it not quite agreeable to pay the interest, to say nothing of the principal, got a lawyer to contest the validity of the bonds, partly on the ground that the Railroad did not quite keep up its agreement, and partly on the ground that it was "unconstitutional" for the town to issue the bonds. To curry favor with the people (voters) a Politician Judge decided against the bonds. The widow is unable to carry the case up to a higher or to a juster court. The other holders of the $50,000 Bonds are doubtless like situated, and being widely scattered and unknown to each other, they can not combine their efforts. And so the town of ——has cooly pocketed the $50,000 savings, needed by widows and orphans, and while they are sitting enjoying their comforts and luxuries, these innocent contributors of hard-earned cash are thrown into penury and want. They trusted in the good faith of the people who issued those bonds and loaned money on its credit." Comment is unnecessary....Postal Cards are a great convenience, but they are largely made use of to promote various doubtful and swindling schemes. Here we have the country flooded with postal cards advertising

THE "UNITED STATES WASHING MACHINE."

Sometimes it is "Lynn & Company," or it is "Sisson & Company," and they are "Importers and Exporters of Machinery." The parties named make a "Very special offer" to the one who receives the card, which it is, "If you will promise to show the U. S. Washing Machine, to any ten of your lady friends," they will send the machine packed and prepaid, to the person addressed, and also make terms for the sale of machines, etc. The "party of the other part," is asked to send only 75 cents, "which we have estimated will just cover the cost of packing, and the various charges to your point." This machine—so says the card, "is indeed a very remarkable labor-saving invention, doing entirely away with all the miseries of wash day"—and for 75 cents.—"It will," says the card, "do the work of several women," and much more to the same effect, and all for 75 cents and a promise to show it "to any ten of your lady friends." Having great curiosity to see what kind of a washing machine could be sent to Indiana and Kansas, for 75 cents, and feeling it to be something that our readers should know about, we

STARTED ON A VOYAGE OF DISCOVERY.

No. 36 Beekman Street was easily found, but not so easily the office of Sisson & Co. They occupy the *first floor*, if one begins his count from the sky downwards. The door stood open, and a man stood in the doorway. He didn't say, "Walk in," but his manner said as plainly as could be, "Keep out." The glimpse obtained of the interior was not tempting, evidently that room was as innocent of "washing," as we believe it to be of "machines." We would see Mr. Sisson. He of the door had a different view of the matter. We couldn't, as "it was after office hours."—A look at the time-piece gave 12.15 P. M. as the hour.—We would see the "United States Washing Machines,"—not much. He of the door informed us that they "did business according to a system"—one part of the "system" evidently being to keep people out of that room. Mr. S. would be back at 3.30, but it would be of no use for us to call then, as it would be "after office hours." We learned that the machines were all packed and ready for shipment, and also learned that Mr. Sisson did not care to be seen—unless indeed he of the door were Sisson himself. Our next departure was for

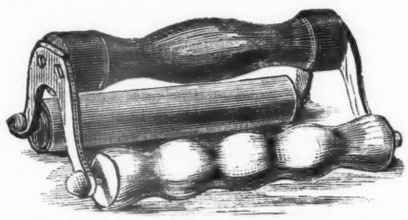
"THE IMPORTERS AND EXPORTERS OF MACHINERY,"

Lynn & Co., Nos. 104-106 John Street, which, in due time, was found. No man in the door here, but within the portal was a woman, and as communicative and affable as Sisson was short and surly. Here were machines too, real washing machines. We inspected—and as we inspected we learned: that the machine was a new one; was not advertised in the ordinary way, the object being to sell through agents—some agents sell a good many,

others failed.—The machines were made in New Jersey. Stacks of letters upon a table indicated a large correspondence; there were many machines packed and ready to be sent off. We could not resist the temptation, and bought a machine—

HERE IS A PORTRAIT OF THE U. S. WASHING MACHINE!

The card says: "The machine is simplicity itself." An inspection allows us to confirm this statement. This Washing Machine is 5½ inches long, 4¼ inches wide, and 2¼ inches in altitude. There are two rollers, one handle, and two castings (one at each end), and 4 screws —"simplicity itself." The card states that the "iron parts are covered with zinc to prevent rusting"—true again, and moreover "the wood-work is made from the hardest and best seasoned timber." The handle is black walnut, one roller with an irregular surface is of ash, and the other roller is covered with



THE "UNITED STATES WASHING MACHINE."

rubber—stuck into a piece of rubber tube—does not show. The U. S. Washing Machine weighs 8 ounces, and goes by mail for 10 cents. The machine must have cost nearly 10 cents to make it, and the profit of at least 50 cents on each 75 cent trade, is very fair considering the capital invested. Their "confidential wholesale rates are $36 per gross, which is 25 cents each." A washing machine for 25 cents! But we have omitted the

"DIRECTIONS,"—HERE THEY ARE.

"Use with any wash tub and board. Grasp the handle or rest the fingers on the cross piece, and rub the clothes backwards and forwards, pressing lightly. The friction of the corrugated rollers cleanses thoroughly. Dip the clothes or machine into the water as often as it is pressed out. When ready to rinse, roll the machine over the clothes as they are drawn out of the water."—We altogether object to that last sentence. This is a "*washing* machine," and you have no right to use it as a wringer, especially as a chap in Chicago makes a wringer which is much such a wringer as this is a washer. Parties calling themselves James W. Winslow & Co., and other aliases, advertise wringers at $1.50 and $2.50 each, which they modestly call "the best wringer in the world." Our friend Browning, President of the Metropolitan Washing Machine Co., thinking that he made a pretty fair sort of wringer in the old, well known "Universal," had a natural curiosity to see

"THE BEST WRINGER IN THE WORLD,"

and wrote to a Chicago Correspondent, to get him a sample. The Chicago man went to the advertised place, and found—a vacant lot, but after hunting with the aid of the Post Office folks, he at last found the wringers—and they are on exhibition at Mr. B's. New York office. Such a caricature upon a useful machine, we never before saw! It might help in washing, but not as a wringer, its place is under the boiler, to help boil the clothes. In the $1.50 wringer, the rollers are a couple of round sticks, but for $2.50 you get a thin piece of rubber over them. It is a good deal to have seen such a washer and such a wringer all in one day... It was suggested last month, that there would be various

SWINDLES PLAYED WITH THE CENSUS.

and gave a brief account of one of them.—Now comes another. Well dressed chaps visit the houses of well-to-farmers, and leave blank forms to be filled out showing the amount of certain crops raised on the farm. The unsuspecting farmer fills out the blanks and is requested to sign it. In a few weeks the farmer is notified that his note for $100–$200—as the case may be, is due at such a bank. The note turns out to be made over his signature to the census paper. The census will not be taken until June, of which due notice will be given, and no doubt the officials will be able to show that they are the proper persons.....Here is more Postal Card work. This time it is an advertisement making a special

OFFER OF SILVER TEASPOONS,

by the "Tremont Spoon Company, of Boston." For 60 cents they send a set of six teaspoons. This is just 10 cents a spoon, which may be cheap or dear, according to the spoon. But it would look more business-like if the Tremont Spoon Co. of Boston, would give a street and number, and not have several of their cards, which are called "certificates" and to be returned with the order, all bearing the same number, 1723.....The most ridiculous "craze" just now is in reference to the so-called

ELECTRIC MEDICAL BATTERIES.

These are affairs about the size of a half dollar, made of two different metals, hung by a silk cord, and to be worn "as near the heart as possible." This thing is offered as "the most effectual and sure remedy for all diseases of the blood and nerves." What is the strangest thing about it all is, that people will believe that the wearing of the thing does them good. There is Boyd's Battery, with its "gimlet-pinted" electricity, and one apparently sincere man writes that it helped his wife when she did not know what the thing was. But then here comes one Elias, who says that "a wooden button worn upon the breast would be quite as effective as the so-called 'batteries' which have hitherto been sold as curative to an over credulous public."—That is one thing in Elias' circular that we can fully believe. But then Elias goes and makes an affidavit, and publishes it, and we will say that

IT IS A GOOD DEAL OF AN AFFIDAVIT.

It tells that there is no such chap as Prof. J. C. Boyd—that the battery of Boyd is not patented—and that his battery "was, and is, a contemptible fraud"—and ever so much more of the tallest kind of affidaviting—but alas! not one word about Boyd's "gimlet-pinted" electricity.

Elias has the thing brought to the finest point. He is logical. He tells us

"THE BLOOD IS THE LIFE,"

that is his starting point, which no one can deny. Then "Electricity is the Life of the Blood"—that's not quite so clear—but we are informed that his Medical Galvanic Medal generates electricity—and there you are, what more do you want? Our medal is the only one that turns out the real sort of Electricity.—"Electricity is the Life of the Blood.—"The Blood is the life"—would you live?—Then wear our medal. All else follows, from Rheumatism to Corns. The affidavit of Elias declares that Boyd's Battery is a "worthless fraud." Yet we know an intelligent young lady who can feel the electricity as soon as she takes it in her hand! One druggist in a small town sells several of these batteries every week, and the buyers are sure they are benefited. There is a pitiable popular ignorance about electricity, and an equally pitiable readiness to believe whatever is said about it. The idea that any combination of metals worked up into a medal and placed upon the skin, can have any effect upon the body in general, is simply absurd. Still it is asserted, and people like to believe it, just as some otherwise intelligent persons believe that carrying a Horse Chestnut in the pocket will keep off rheumatism....Last month we stated that a person was cutting a big swath in the doctoring field in Ohio, and claiming to be from

THE GREENLEAF MEDICAL INSTITUTE

of New York City. We hinted at the remarkable modesty that refrained from giving the street and number of a remarkable Institute, that could send out such a remarkable doctor as Dr. Greenleaf, the son of his father. Now we get the fellow's circulars from Davenport, Iowa, and these read: "Greenleaf Medical Institute, No. 648 Broadway." To be in New York City several hours daily, and not know about such an Institute, was a state of ignorance not to be endured, and so soon as we had the number we started from 245 for 648. So far from finding any sort of a Doctor's shop,

NO. 648 IS THE ST. CHARLES HOTEL!

The clerk of the hotel had never heard of Doct. Greenleaf or his Institute. As the most likely means of learning about such a chap we inquired of the policeman of that beat. He knew nothing of Doctor Greenleaf or his Institute.—Yet the honest people of Ohio are running after and paying money to this pretender—even the press helps him with favoring notices.—To judge from his circular, we do not think that the fellow is any more of a doctor than the St. Charles Hotel is an "Institute."

Early Strawberries.—The first arrival of strawberries from Florida, was about the first week in Jan., and since then the market has been well supplied. We have kept the run of the fruit that has been offered, and have been surprised to find that the variety reaching market in the best condition, is Charles Downing, a berry generally regarded as too soft for transportation to great distances. The fruit from Florida makes the greater part of the journey by steamer in a refrigerator, and, as a general thing, arrives in excellent condition. While some varieties, like the Wilson, become dark colored and dull, after they have been picked for a day or two, the Charles Downing remains as bright and lively in color, as if just from the vines—a most valuable quality in a market fruit, and especially in one for shipping.

The Great Dog Show.—The exhibition of the Westminster Kennel Club, has become an established institution, and is looked for with the crocuses. This year the show will be held on the 27th, 28th, and 29th of the present month, the entries closing on the 12th. We recorded the great success of last spring's show, but the managers think the coming one will excel all former exhibitions in attractiveness. As in former years, Madison Square (formerly Gilmore's) Garden, will be the place.

(*Basket Items continued on page* 159.)

Bee Notes for April.

BY L. C. ROOT.

In most locations bees will be placed upon their summer stands during the present month. At this season of the year great care should be taken to give the bees every advantage and encouragement to increase in numbers. After they have had an opportunity to fly freely, the hives should be examined and thoroughly cleaned. A good way to do this is to start with a clean, empty hive, and place it upon the stand of the first hive to be examined, having the one containing the bees directly in the rear; lift the combs from the old hive and place them in the new one. After cleaning the hive from which the bees have been taken, pass to the next, and transfer from that into the first hive, and so through the yard. When handling the hives, be sure that each colony has a laying queen, and plenty of honey. Let there be only a sufficient number of combs for the bees to occupy. Carefully open the hives in the morning, when the bees are compactly clustered, and remove those combs not occupied by the bees. This will allow those inexperienced to decide the proper number of combs to leave. The combs that are thus removed from the hives should be cared for, and kept in a dry place where mice or rats will not have access to them. If any colonies should be found queenless, unite such with the lightest stocks that have good queens. After the bees have had an opportunity to fly for a day or two, the presence of a queen may usually be ascertained by the presence of eggs in the combs in the center of the cluster. When the number of frames is limited, have a good, close fitting division board at the side of the combs to diminish the space which the bees must keep warm. Contract the entrance to the hives, and be sure that all upward ventilation is prevented. All this should be done in the middle of the day when it is warm. Care must be taken not to expose combs, or in any other manner to induce robbing. After bees are put in proper shape do not make the mistake of opening the hive too often until the season is sufficiently advanced. Handling bees too early, to stimulate breeding, often results greatly to their injury. As the season grows warmer, and the bees increase in numbers, combs may be added.

ANSWERS TO CORRESPONDENTS.

SIZE OF BOXES.—"What is the most desirable size for section honey boxes?"....This subject is receiving much attention of late. It was discussed at the session of the North Eastern Bee-Keepers' Association, recently held at Utica. The sizes that are the most used at present are 4 by 4 inches, 5 by 5 inches, and 5 by 6 inches. The honey dealers of New York have decided in favor of the medium size, which takes 5 by 5-inch glass, and weighs about 1¾ lb. when filled with honey. Two inches is the proper width.

MRS. COTTON'S METHOD.—A correspondent writes: "I have received a circular from Mrs. Lizzie E. Cotton, in which she claims large yields of honey, if we will adopt her hive and system of management. Is it reliable?"....The numerous inquiries in reference to the above mentioned circular, make it necessary that we should give our views. One with but a slight knowledge of matters relating to bee-keeping should be able to see at once that the statements in this circular are not reliable. For the benefit of those who are uninformed, we would say that we have known of this Mr. Cotton (it is said that it is *he* who sends the circular) for many years, and regard his claims as to his hive and his statements as to the management of bees as thoroughly unreliable. Whoever is induced by the statements of this circular to commence bee-keeping, will be sure to meet with great disappointment.

COMB-FOUNDATION.—One correspondent asks: "Do you advise using comb-foundation in honey boxes. How large should the piece be, and how do you fasten it in the box?"....A Foundation is now made which is so very light that it is not objectionable in the boxes. Make the guide for each comb of the width of the box at the top, and let it come to a point at the bottom, as shown in the engraving. Some advise a piece of the full size of the box. Whatever the shape, it should reach to within about three-eighths of an inch of the bottom of the box, so that the bees can reach it. I use the best white glue to fasten the foundation in the boxes.

BROOD FRAMES.—"Do you advise filling brood frames with comb-foundation before hiving a swarm?"....If you use foundation in which wires are incorporated to prevent sagging, its advantages cannot be over estimated,

as you can thus secure straight worker combs throughout, and the hive will be filled sooner than without them.

Fences and Fencing.

Fencing Letters Unanswered.

It is simply impossible to reply individually to many hundreds of letters—at least a bushel of them—asking specifications as to cost of iron fence, lists of manufacturers, opinions of this and that particular variety, the value of this or that old or new form, whether this or that new form is patentable, what we think of it, etc., etc. The best we can do is to read over what is received and prepare for these columns such materials as seems to be most worthy of publication for general information.

But more Letters are Wanted.

We want many more letters from those who have *used* barbed wire fencing for a year or so, telling plainly the present opinion of the user, in regard to its value, its dangerous character or otherwise, whether the user will put up more and advise others to do so or not, what kind is used, and any other items in the same line; and we desire to know in each case whether the writer has any direct or indirect interest himself or through friends, in the sale or manufacture of any kind of fencing. Several letters have come strongly recommending one kind or another, which have upon investigation been found to have come from *interested* agents, whose opinions are necessarily colored by such interest.—We have not the slightest interest in any one kind over another, and neither sell nor supply *any* kind.—Our only business is to collect and supply information that may be most useful to all our readers, and to promote investigation and improvement. These last remarks are made necessary by the receipt of numerous letters saying: "Send me your circulars and the cost of (this or that amount) of fencing"—letters doubtless written by those who only learned through other journals that we are giving special attention to this subject.

NOTE.—In describing the iron post, fig. 27, on page 92 last month, it was credited in some of the first copies to Phillip S. Justice. It should have been Abram G. Powell & Co., Philadelphia, and was printed correctly in the later issues. The advertising pages gave the manufacturer's address.

Weight of Iron Posts by Measuring.

A solid or cubic foot of water at ordinary temperature (62° F.) weighs 62½ lbs. avoirdupois, and 27⅝ solid inches (27.648) weigh 1 lb. Wrought iron has a specific gravity of 7.645 to 7.817—average say 7.731, that is, it is about 7¾ times as heavy as water. Therefore a trifle over 3½ solid inches (or 3.575 solid inches) of wrought iron weigh one pound. Examples: A bar of iron 1 inch wide, one-half inch thick, and 6½ feet (78 inches) long, contains 78x1x½, or 39 solid inches. Adding 4 cyphers to the right and dividing by 3.575, gives the weight of such a bar in pounds and tenths, that is 10.9, or 10⁹/₁₀ lbs. A wrought iron bar 6 feet long, 1¼ inches wide, ¼ inch thick (72x1¼x¼), equals 27 solid inch, and 27.000÷3575 equals a little over 7.5 or 7½ lbs. Cast iron is nearly one-eighth lighter than wrought iron, say 13 per cent less.

A Wisconsin Farmer's Talk About Fences.

To Editor of American Agriculturist:

I wish to say a few words with regard to the "*Barbed Wire* Fence" question. With all the figuring on this point, I find no showing describing how it is possible to build a *lawful* fence with wire. It would be a grand thing for the country if this could be done, *but it can not* unless 7 to 10 wires are used. Even then I doubt whether it would turn pigs, and any fence that won't do that, is not the thing for a majority of farmers to adopt.—I could give you facts and figures to substantiate what I say, but do not wish to be tedious. I own a snug little farm of 82 acres here, and I have at least ten different kinds of fencing on my place, "Barb Wire" included, so I know of what I speak. Whenever any man can show me how to build a wire fence that will be pig-proof, then I will adopt the plan, even if it cost one-half more to construct it, for in the long run it will be much cheaper than wood fences. Meantime, we must be content to get along the best way we can.

A GOOD FENCE

can be constructed in either of the following ways—fence-boards 16 feet long; posts 8 feet apart:

3 boards and 2 wires.	*or 3 boards and 2 wires.*
3½ inches to first board.	3 inches to first board.
6 inch fence-board.	6 inch fence-board.
3½ inches to second board.	3½ inches to second board.
6 inch fence board.	6 inch fence-board.
6 inches space.	5 inches to third board.
6 inch board.	6 inch board.
10 inches to first wire.	9½ inches to first wire.
13 inches to second wire.	13 inches to second wire.
54 inches total hight.	52 inches total hight.

The law in this State (Wis.) requires fences to be 4½ feet high, or 54 inches, but I would be willing to risk a wire fence 50 inches in hight, thus: 50 inches to top wire, 37 inches to next, 27 inches to next, 19 inches to next. The bottom space of 19 inches left can be managed this way: Make portable pieces of fencing by nailing two 4-inch wide fence-boards on to stakes, and driving them down at bottom; they can be taken up at pleasure. True, a fence of three or four wires will do for cattle and horses, and may be a good thing out in Texas or Colorado, and other Western States and Territories, but for general adoption it is not the thing, because you can not construct a perfect or lawful fence with it. As to the present forms of barb wire being dangerous to stock, I have only to state that whoever says so, does not know what he is talking about. I have two horses that stick their heads over and between the two top wires of my fence, only 11 inches apart, and crowd them down and reach at least a foot on the other side the fence, and eat the crop close to the ground, and I have seen cows do the same, and I use the Frentress Wire, which is, perhaps, the severest kind manufactured.

There is not a single form of Barb Wire at present in use that is half *barbarous* enough. My stock have never received the least damage from the wire, and I don't believe they ever would, were the barbs ten times as severe, in fact we need a more severe barb wire introduced, and then we may hope to make a pig-tight fence by putting 3 or 4 wires pretty close together at the bottom of the fence.

ROBERT WOOD.

GRANT COUNTY, WIS., *March* 1, 1880.

We give the above as a sample of several letters from intelligent men. Others express themselves equally strong against the use of barbed wire, as *barbarous*, as dangerous to horses, cattle, and sheep, as having "the barbs festooned with wool picked from sheep, etc." One of the most frequent objections we hear just now is, that in plowing up to barbed fences, either along side of them or at the head-lands, the team has to be kept at such a distance that there is almost as much waste land as in the use of the "Virginia" or "worm" rail fence.—Thus far, the opinions are so contrary and so nearly equally divided, that one is at a loss what to decide, and we urgently invite further correspondence as stated above. The fact that serious injuries have resulted from the use of long barbs is not set aside by the statements of others that they have experienced no trouble. The question to be decided is: Is the danger to animals, and are the objections on account of working up close to them, their tearing of garments, etc., sufficient to militate against their advantages? It is contended by their advocates that unless the points are both long and sharp, they will be little more feared and be but little more effective, if any, than the old plain wire; that animals eager to reach good feed will not be stopped by anything short of rows of sharp spears that will pierce to the quick. There is a good deal of force in this statement, more than we were ourselves at first disposed to concede. But our position has been, and is, that of an unprejudiced and, personally, uninterested collector of information, a *learner* in behalf of our readers and the public.

We have a farm needing new fencing, but we are still patching up the old fence, partly because the collected experience is *not yet* sufficient to enable us to decide upon the best kind, and partly because new forms and new devices are being called out by the agitation of the subject, and we are hoping to find something better than has yet been brought before the public, both for posts and for the running fence. We are convinced that a good fence, both posts and wire or straps, made of steel or iron, or both, is far superior to wood as respects durability and freedom from repairs; that a metal fence thoroughly protected against corrosion will be cheaper in the end, at double the cost of wood—except in the few localities where locust, red cedar, and chestnut timber are abundant and cheap.

As previously stated, the very recent "boom" in the prices of iron and steel, amounting to fully 100 per cent, has temporarily checked and delayed the general adoption of these materials for fencing and especially for posts. Still, the cost of the raw material being only a comparatively small part of the running fence, exclusive of posts, the advance in cost of wire has not been so great as to prevent its pretty general adoption. Indeed it is indispensable in many parts of the country, because of an absolute lack of wood on the spot, and the large cost of its transportation, while lumber itself has risen in value very materially. The supply of iron and of steel is unlimited—the earth's surface is full of it, so to speak, or at least the deposits of iron ores are inexhaustible, and the processes of reduction and manufacture are being constantly cheapened by new discoveries and inventions.

The present high prices are merely the result of a temporary sudden great demand. Iron and steel can be profitably produced far below the present selling rates, and the demand will be met by increased production, so that we shall in the near future be able to obtain them at perhaps as low rates as before the recent advance. In the meantime, while continuing to use metals for new fencing, the country will be ready with improved forms of posts, to use iron and steel as the chief fencing materials, as soon as prices become normal.

A Choice as to the Length of Barbs.

In corresponding with manufacturers, at least two leading establishments express to us a readiness to meet the wishes of purchasers, by providing barbs of any length or *shortness* and *bluntness*, that may be desired, and we presume most others will do the same. They nearly all assert that the prevailing present demand is in favor of long and sharp barbs. As we have already stated, the use of long and sharp barbs will not be submitted to by the public if placed upon fences along traveled highways, and anything that can catch and tear garments, or scratch the human skin must be absolutely prohibited where, in village or country, the margins of the public streets are used as sidewalks. We doubt if legislative enactment will be or should be made to prevent any one from erecting his interior fences as *barb*arous as he may choose—except where Mr. Bergh and his humane co-workers may interfere in behalf of the dumb animals. Any barbs having a hooked form should be rejected.

Fig. **28** comes from "Citizen," Philadelphia, who has known this form used successfully for ten years past. The base piece is made of cement and gravel by the farmer himself, one barrel of Rosendale Cement, with fine gravel, sufficing for about 35 of the bases. Diameter of bottom, 14 inches; hight, 13 inches. (These dimensions can be larger or smaller, according to the looseness or firmness of the soil). An opening in the top 5 inches or so in depth admits an iron bar, say one inch wide, half-inch thick, and three feet, or more, high. The bar is fastened in by pouring around it melted sulphur. "Citizen" says it stands so firmly, that he has seen the bar bent nearly to the ground without disturbing its base fastening.

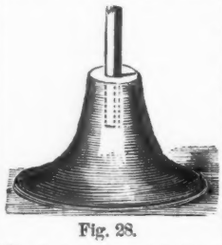


Fig. 28.

The bar can be notched or pierced for attaching the horizontal wires. If made of steel, it can be of smaller size. Such a post may be usefully employed in many locations, but digging the large holes required to receive the wide base would be objectionable for extensive field fencing. The depth re-

quired, however, is only half that needed for smaller bases, and there would be no lifting by frost. At $1.75 per barrel for cement, and with gravel at hand, the outlay for 35 bases would be 5 cents each. A wrought iron bar 1 inch wide, half-inch thick, and four feet long, weighs about 6¾ lbs.

Important to Every Farmer.

The American Agriculturist Farm Experiments to be Continued.—A Key to Valuable Knowledge Placed Within Reach of All.

All the talk about "Progressive Farming," "Improved Agriculture," "Science Applied to Farming," has two objects; the increase of the farmer's knowledge and of his crops. If a farmer must invest $19 to get $20 of increase from a field, it is poor science, and poor farming; but if by investing $5 on a field the increased crop brings him $20, then "Science Applied to Farming" pays, and it pays him to know the reason why.

There are Some Settled Points in Agriculture.

Among these are: 1. All soils, excepting of course the virgin ones of the newer States, for profitable culture *must be* manured. 2. The larger the crop upon an acre, the cheaper per bushel, ton, etc., should that crop be raised. 3. In our ordinary farming no farmer makes all the manure that he could profitably use upon his farm. 4. The main value of manure (stable or bard-yard) depends upon certain constituents, and these may be had in other forms; in artificial or chemical fertilizers. 5. All soils do not alike need the *same* fertilizers. 6. It is a well established fact that while it will pay the farmer to buy the fertilizers his soil needs, it is a waste of money to buy and apply to his soil, constituents of which it already has enough. The question will naturally follow—

How Can We Find Out What the Soil Needs?

It is to help every farmer to answer these questions: "What does my soil need?" "What fertilizer can I buy that will pay a profit in crops?" that the *American Agriculturist* Experiments were instituted. These experiments were begun in 1878, and were continued last year. Several results were given last month, and this month we present on page 136, in a tabulated form, an array of facts that will convince the most sceptical that

The Right Fertilizer in the Right Place

will pay. And not only pay, but the profit on the investment is often such as to help answer the vexed question: "Will Farming Pay?" These results were obtained by just such men as *you*, "Farmer A," or you, "Farmer B," on just such farms as yours, and by just such means as are within your reach. These men are farmers, like yourselves.

Now there are thousands, yes, tens of thousands, of just such men as these all over the country; every township, every neighborhood, has one or more readers of the *American Agriculturist*, who would have the same knowledge of their own fields that these farmers have of their soils. If these farmers knew that it would *pay* to buy Potash, or Phosphoric Acid, or Nitrogen, they would buy it, but they can not afford to run many risks. It is evident that every one of these experimenting farmers now knows better, to a certain extent,

Just What He Wants and Does Not Want

to put upon *his* land this year. Not a farmer who reads this but would gladly give $5 or $10 to know as to his farm what these people know as to their's. There is no way in which this information can be had so cheaply and so certainly as that by which these farmers acquired it. They asked the soil, and

The Soil Responded.

The questions were in the bags of the AMERICAN AGRICULTURIST FERTILIZER EXPERIMENTS. The results obtained last year are so valuable, not only to the experimenters themselves, but to agriculture generally, that we propose to

Continue the Experiments in 1880.

While changes, and it may be some improvements might be suggested, yet for the sake of uniformity and to prevent all mistakes, the methods and plans of last year will be unchanged for 1880. The same fertilizer in (with one exception) the same sized parcels, will be sent out with the same directions, at the same prices, and by the same dealers, though the prices of some materials have so advanced that it will be done at a loss.

The Manner of Conducting the Experiments

was given in full in the April No. of last year, and will be explained plainly and in detail in the directions that accompany the fertilizers. We need only here give a general idea of what is to be done. Those who consult the article given in April last will find that *three* sets were offered, for one fourth, one half, and one acre, respectively. The offer this year is the same in every particular, except in the omission of the first, or quarter acre set. Very few called for that, and the area of land being too small for satisfactory results we now offer but

Two Sets of Experimental Fertilizers.

Viz.: Set No. 2 for half an acre, cost $5, and Set No. 3, for one acre, cost $8.30. It is thought better to avoid all confusion to continue the *same numbers* (2 and 3) for these sets that they bore last year, omitting No. 1. In order to insure uniformity in the fertilizer furnished by the several parties who have agreed to supply them, the publishers have stipulated that samples shall be analyzed by Prof. Atwater, and that they shall in every case be satisfactory to him as to quality. Full directions for making the experiments will be furnished with the fertilizers, and also blank forms for recording the results. The farmer who orders this half-acre set will find it labelled thus:

AMERICAN AGRICULTURIST FERTILIZER EXPERIMENTS } 1880.

No. 2—Half Acre Set.

Cost of Set of Fertilizers, in bags, shipped, $5.00.

This will consist of *eight* bags, *A*, *B*, *C*, *D*, *E*, *F*, *G*, *H*, which are to be used on eight plots, two being left unmanured for comparison. Bags *A*, *B*, *C*, contain *Nitrogen*, *Phosphoric Acid* and *Potash*, singly. Bags *D*, *E*, *F*, contain these constituents in twos. *G*, contains all three together, and *H*, contains *Plaster* only.

EIGHT RODS.

TEN RODS—each Plot one Rod wide and Eight Rods long.)

Plot 0.... No Fertilizer; for comparison.

Plot A.....*Nitrogen.*
Bag **A**, containing 10 lbs. of Nitrate of Soda.

Plot B....*Phosphoric Acid.*
Bag **B**, containing 15 lbs. of Superphosphate.

Plot C.....*Potash.*
Bag **C**, containing 10 lbs. of Muriate of Potash.

Plot D....*Nitrogen* and *Phosphoric Acid.*
Bag **D**, containing 7½ lbs. of Nitrate of Soda. mixture of 15 lbs. of Superphosphate.

Plot E....*Nitrogen* and *Potash.*
Bag **E**, containing 7½ lbs. of Nitrate of Soda. mixture of 10 lbs. of Muriate of Potash.

Plot F....*Phosphoric Acid* and *Potash.*
Bag **F**, containing 15 lbs. of Superphosphate. mixture of 10 lbs. of Muriate of Potash.

Plot G...*Nitrogen. Phosphoric Acid, Potash.*
Bag **G**, containing 7½ lbs. of Nitrate of Soda. mixture of 15 lbs. of Superphosphate. 10 lbs. of Muriate of Potash.

Plot H....*Plaster* (10 lbs.)
Bag **H**, to learn the effects of this fertilizer.

Plot 00 ... No fertilizer, for comparison.

How to Use these Fertilizers.

Select a piece of uniform soil, as nearly like the rest of the field as may be. It can be marked out in any field prepared for a crop. It should be nearly level, so that one plot will not receive the washings from another. When plowed and harrowed well, mark off with stakes, in 10 plots, as shown in the above diagram; one plot for each bag, and calling them as here indicated.

Here you have the first and last plots marked 0 and 00, while the others are one for each of the eight bags, which are marked with the same letters. Sow each bag uniformly over its own plot; that is, bag *A*, on plot *A*, etc. (the fertilizers are all finely ground and dry).—Harrow the fertilizers well into the soil, running the harrow lengthwise of the plot, taking care to confine each fertilizer to its own plot. Then plant or sow corn, potatoes, or any other crop over the whole, the same amount on each plot, running rows lengthwise of the plots, and cultivate and treat the whole alike during the season. N. B.—Those who wish, can divide the whole plot across into halves, planting, say, corn on the left-hand half and potatoes or other crop on the right-hand half, so that each crop shall extend *across* the fertilized strips. It is important to select worn out soils for soil tests, that is, those having only their "natural strength," and little or no richness left from former manuring. The soil must be uniform, or the tests will mislead.

What the Experiment will Tell:—

FIRST: By watching the growth, and measuring the gathered crop, it will be easy to see how the crop on that soil is affected by Potash, or by Nitrogen, or by Phosphoric Acid, or by combinations of them.

SECOND: By comparing each plot with the *no fertilizer* plots, 0, 00, it will be easy to see which fertilizer pays expenses, or the greatest profit.

THIRD: Such an experiment will be interesting, will stimulate thought, and prepare for more extended investigations. If there are boys on the farm, it will awaken interests in their minds, and be a good agricultural school, on a small scale, at home. The Pamphlet sent with each Set will greatly help in this.

FOURTH: It will be a good step towards helping each experimenter to decide for himself, and for his neighbors, *what* fertilizers, if any, they can go into more largely in the future.

Of course a single trial will not tell the whole story. The trials should be continued through subsequent seasons. This is not a royal road to knowledge, but it is a start in the right direction.

NOTE.—It will be a good plan to add other similar Plots, and apply on them severally, stable manure, lime, and any other fertilizer at hand, for making a comparison.

☞ The above is very simple. The bags are all of accurate weight, with standard fertilizers of known quality and composition, and all the experimenter has to do is to mark out the plots, and use the bag marked for each plot. The result in the growth and in the yield will indicate what each fertilizer will do, on any soil for the crop or crops grown, also what any two of them will do if used together, and what all will do used together. The different materials in each bag are thoroughly mixed and prepared, so that they have only to be sown without further mixing or care.

The Second Set is for one acre, and is marked:

AMERICAN AGRICULTURIST FERTILIZER EXPERIMENTS, } 1880.

No. 3—One Acre Plot.

Cost of Set of Fertilizers, in bags, shipped, $8.30.

This is the same as *No.* 2, except that the quantity in each bag is *doubled*, for plots of double size (one-tenth acre each). As the expense for bags, putting up, shipping, etc., will be the same, for each set, the double amount of fertilizer put in will cost only $8.30, instead of $10. With the larger plots, more valuable results will be obtained, and more than one crop can be tried. The expense of the fertilizers, $8.30 per acre, will very likely be more than returned in the increased crop on a part of the plots. We strongly advise all to try Set

SAMPLES OF THE AMERICAN AGRICULTURIST FIELD EXPERIMENTS WITH FERTILIZERS.

Results with Corn, Potatoes, Turnips, and other Crops, with different Fertilizing Materials in 1878 and 1879.

PRODUCE, INCREASE, AND GAIN OR LOSS PER ACRE.

1 Acre=0.40 Hectare.
1 Bushel=0.36 Hectolitre.
1 Pound (avoirdupois)=0.45 Kilogramme.
1 Bushel per Acre=0.9 Hectolitre per Hectare.
1 Pound per Acre=1.12 Kilogramme &c.
$1.00=about 5 Francs or 4 Mark.
1 Franc=19.3 Cents; 1 Mark=24.8 Cents.

ABBREVIATIONS USED.
Cl., Clay. Lse., Loose.
Snd., Sand, Sandy. Lt., Light.
Grav. or Gr., Gravel. Yel., Yellow.
St., Stony. Hpn., Hardpan.
Calc, Calcareous. Rd., Red.
Var., Variable. Med., Medium.
Hvy., Heavy, Unf., Unfavorable.
Cpt., Compact. Fav., Favorable.

Number of Experiment.	Experimenter.	Year.	Surface Soil. Kind.	Texture.	Moist'e	Sub-soil.	Previous Cropping.	Weather. Temp'e.	Moist'e.	In Gen.	Number of Plot.....	0	A	B	C	D	E	F	G	H	
											Kinds and Amounts of Fertilizing Materials applied per Acre.	No Manure.	Nitrate of Soda, 200 lbs.*	Dissolved Bone Black, 300 lbs.	Muriate of Potash, 200 lbs.*	Nitrate of Soda, 150 lbs. Dis. Bone Black, 300 lbs.	Nitrate of Soda, 150 lbs. Muriate of Potash, 200 lbs.*	Dissol. Bone-Black, 300 lbs. Muriate of Potash, 200 lbs.*	Nitrate of Soda, 150 lbs. Dissol. Bone-Black, 300 lbs. Muriate of Potash, 200 lbs.*	Plaster, 300 lbs.	Farm. Manure.
	CORN.										Cost†		$7.55	$5.25	$4.50	$10.88	$10.13	$9.75	$15.38	$0.80	Var's
											Yield		bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.
1	E. K. Haight, Freehold, N. J.	'78	Clay loam.	Compact.	Wet.	Compact.	Meadow.		Wet.												
2	G. G. Childs, Swoopes Depot, Va.	'78	do.	do.	Dry.	Clay.	Pasture.		Wet.	Unf.		6.5	8.2	23.0	5.8	25.6	8.7	8.2	10.0	5.0	
3	John W. Pierce, W. Millbury, Mass.	'79	do.	do.	do.	Gr h'pan.	Meadow.	Cold.	do.	do.		3.8	2.7	12.0	6.7	12.0	5.5	16.7	13.7	3.6	10.4
4	John Flanagan, Paola, Kansas.	'79	Clay.			Cl. h'pan.	Corn.	Warm.	Dry.	do.		18.5	20.8	20.3	17.8	19.2	12.9	17.6	20.1	13.0	39.7
5	W. I. Bartholomew, Putnam, Conn.	'79	Clay loam.	Loose.		Compact.	Meadow.	Med.	Med.	Fav.		17.7	18.7	39.9	19.1	41.9	21.1	43.1	51.7		49.6
6	do. do. do.	'79	do.	do.		do.	do.	Cold.	Wet.	Unf.		8.1	7.4	36.5	7.7	41.4	7.1	42.0	45.7		46.0
7	Buel Landon, South Hero, Vt.	'78	do.	Light.	Med.	Gr. clay.	Oats.		Var.	do.		7.0	17.5	10.3	9.2	16.5	15.0	18.6	13.5	14.4	48.6
8	do. do. do.	'79	Clay calc.	Loose.	Dry.	C'pt clay.	Meadow.	C ld.	Dry.	do.		19.7	34.2	22.3	11.0	31.3	27.2	14.0	33.4	25.8	18.0
9	Chester Sage, Middletown, Conn.	'78	Clay loam.	do.		Stony.	do.	Med.	Med.	Fav.		9.1	21.5	16.5	62.3	11.2	68.9	70.3	84.0		43.8
10	D. B. Wertz, Johnstown, Pa.	'78	do.	do.	do.	Clay	Rye.	Cold.	Wet.	do.		7.5	6.2	20.0	12.5	32.5		25.0	30.0	17.5	
11	J. H. Stiles, Morris Plains, N. J.	'78	Gr. Clay.	Light, l'se.	Med.	Cl. h'pan.	Corn.		Wet.	Unf.		9.5	18.0	11.0	42.0	16.0		48.0	56.0	9.0	60.0
12	J. J. Dearing, Covington, Ga. (1)	'78		do.		Dry.	Sandy.	Pasture.	Var.	Var.		5.5	7.5	10.7	7.8	18.4		14.5	18.5	9.4	
13	Geo. Spalding, Mason, N. H.	'79	Loam.	Loose.	Med.	Loam.	Grass.	Cool.		Unf.		8.7	6.8	16.6	10.4	17.7	10.5	21.7	26.6	19.2	32.5
14	W. C. Holmans, Graham, N. C.	'78	Snd. loam.	do.	Dry.	Clay.	Corn.	Cold.	Dry.	do.		8.8	9.0	17.5	7.5	22.5		16.3	20.0	7.0	30.0
15	A. P. Arnold, Vineland, N. J.	'79	do.	do.	do.	Gr. clay.	Vineyard.			Fav.		8.7	37.6	14.6	5.9	29.8	18.4	10.1	18.8	3.7	
16	W. C. Atwood, Watertown, Conn.	'79	do.	do.	Med.		Rye.			do.		8.0	14.7	23.3	29.7	38.7	38.2	46.2	80.2	10.6	20.5
17	J. M. Manning, Taunton, Mass.	'79	do.	do.	do.	Sand.	Meadow.	Var.	Var.	do.		11.3	11.2	16.6	11.0	18.9	10.0	13.3	15.9	4.5	23.0
18	Frank Bourne, Hanson, Mass.	'79	Gr. loam.	do.	Dry.	Gr. & St'y.	Pasture.			Unf!		12.5	37.5	41.2	25.0	22.5	38.0	45.0	45.0	37.4	
19	Z. E. Jameson, Irasburgh, Vt.	'78	Sandy.	Light.	do.	Porous.	Meadow.		Dry.	Unf.		5.0	11.0	8.5	19.5	17.0	28.0	26.0	31.0	15.0	23.0
20	N. B. Lewis, Pine Hill, R. I.	'78	Gravelly.	do.	do.	Gravelly.	Pasture.		Var.		Soils yield'g. no man'e, less than 20 bu.	7.5	5.6	30.7	7.6	28.8		23.8	27.5	7.5	32.5
21	J. B. Mead, Randolph, Vt.	'79										7.7	6.8	7.0	41.3	20.5	39.8	50.8	48.1		46.5
22	Prof. J. R. Farrington, Orono, Me.	'78	Clay loam.	Compact.	Moist.	Clay.	Meadow.					22.9	19.3	29.1	32.9	37.0	42.9	39.0	39.8		34.4
23	E. F. Smith, Tunbridge, Vt.	'78	Loam.	do.	Wet.	do.	Corn.		Var.	Fav		29.7	35.0	35.0	32.5	35.0	32.5	35.0	31.5	27.5	40.7
24	L. W. Stone & Son, Waverly, Pa.	'78	Clay loam.	Loose.	Dry.	Cl. h'pan.	Meadow.	Warm.	Wet.	do.		28.7	35.6	37.5	35.6	38.7		41.9	51.2	32.5	32.5
25	Halsey P. Clark, Wyoming, R. I.	'78	Loam.			do.	do.					26.3	35.1	49.5	35.1	64.4		67.4	86.1	55.6	48.1
26	Zeno Benson, Bridgewater, Mass.	'79	do.	Light.	Dry.	Loam.	Pasture.	Med.	Med.	Fav.		23.9	16.0	26.2	11.0	44.2	14.3	21.4	37.5	19.0	14.0
27	C. Miller & Son, Pomfret, Vt.	'78	do.	do.	Med.	Cl. h'pan.	Meadow.	Var.	Wet.			20.2	40.5	57.2	30.0	67.9		71.0	70.5	55.0	30.0
28	do. do. do	'79	Snd. loam.	do.	Dry.		do.		Dry.	Fav.		21.9	27.5	35.7	23.7	30.0	31.2	28.7	38.7	34.7	15.0
29	Seth P. Rising, Rupert, Vt.	'78	do.	Loose.	do.	Gravelly.	Corn.	Var.	Var.			27.5	51.9	40.0	40.1	47.1	32.4	47.4	53.7	40.0	52.5
30	Charles B. Gale, Plainfield, Vt.	'78	do.	Light.	do.	Yel. loam.	Meadow.			Unf.		20.1	43.7	43.7	39.9	46.3	36.0	53.4	41.1	38.0	29.6
31	J. M. Manning, Taunton, Mass.	'79	do.	do.	Med.	Sand.	Fallow	Var.	Var.	Fav.		22.7	13.3	49.4	45.7	54.5	42.1	56.1	65.0		58.5
32	J. E. Chedel, Pomfret, Vt.	'79	do.	do.	do.	do.	Meadow.	do.	do.	Unf.		25.4	22.0	28.6	37.7	32.3	38.4	47.1	57.5	38.0	35.0
33	W. S. Simmons, Duxbury, Mass.	'79	do.	do.	do.	do.	Rye.	do.	do.	do.	20-30 bu. pr. acre unm'd	20.0	22.3	20.0	24.6	37.0	44.3	24.6	19.4	14.0	
34	Jonathan Dunham, Etna, N. Y.	'78	Gr. loam.	Light, l'se.	Dry.	Stony clay.	Meadow.	do.	do.	do.		24.0	18.5	30.5	20.5	32.0		32.0	31.0	26.0	36.5
35	E. N. Bissell, East Shoreham, Vt.	'78	Clay loam.	Compact.	Wet.	Clay.	Meadow.			Unf.		32.5	37.5	40.0	35.0	50.0	42.5	41.2	41.2	30.0	42.5
36	A. B. Clark, Milton, N. Y.	'78	Loam.	Light, l'se.	Dry.	Compact.	do.			Fav.		33.6	41.0	34.0	45.2	42.3		44.1	51.0	32.0	39.5
37	J. L. Dow, Weare, N. H.	'79	do.	do.	do.	Hardpan.	Corn.	Cold.	Var.	Unf.		41.0	44.0	80.0	73.0	70.0	50.0	64.0	64.0	44.0	
38	M. W. Ladd, Woodstock, Vt.	'79	Snd. loam.	do.	do.	Loose.	Meadow.	Warm.	Var.	Fav.		30.5	37.2	36.6	35.0	39.3		42.7	42.7	31.0	47.5
39	H. Bradley, Brattleboro, Vt.	'78	do.	do.	do.	Sand.	Pasture.					33.0	32.0	31.0	39.3	34.4	30.0	39.6	40.0	27.0	45.0
40	Wm. F. Segar, Wyoming, R. I.	'78	do.	do.	Med.	Clay loam.	Meadow.	Var.				32.8	41.8	32.8	45.8	48.5		64.8	72.8	39.0	
41	H. Pitts, Washington, D. C.	'79	do.	Light.	Dry.	Clay.	Pasture.	Hot.	Dry.	Unf?		25.8	35.7	34.7	27.5	28.2	28.2	29.0	28.2	28.2	
42	Edward Hicks, Old Westbury, N. Y.	'79	do.	do.	do.	Loam, gr.	Meadow.			Fav.		37.8	53.3	54.5	59.6	69.6	62.2	76.5	69.7	59.7	55.3
43	W. Ellason, Chestertown, Md.	'79	Gr. loam.	Compact.	do.	Clay.	Grain.		Dry.	Unf!		34.0	24.3	45.7	31.6	45.6	24.4	48.8	35.7	46.2	
44	H. F. Stevens, Wayne, N. Y.	'78	do.	Loose, l'gt.	Dry.	Clay, st'ny.	Clover.		do.	do.	30-40 bu. unm'd	33.3	31.0	67.5	34.5			61.5	71.5	71.8	
45	H. M. Swift, Chestnut Ridge, N. Y.	'79	do.	do.	do.	Loose.	Meadow.	Warm.		Fav.		36.8	60.9	48.6	63.5	62.8	51.9	60.4	63.3		39.0
46	James K. Toby, Calais, Vt.	'78	Loam.	do.		do.	Compact.	Potatoes.	Cool.	Dry.	Fav.	45.1	48.3	62.6	70.2	68.5	49.9	59.2	70.3	42.6	45.2
47	Cero Blake, Kent, O.	'79	do.	Light, l'se.	do.	Clay & gr.	Meadow.	Warm.	Var.	do.		49.8	58.0	56.0	58.4	63.3		63.0	64.0	55.0	46.0
48	Ora Paul, Woodstock, Vt.	'78	do.	do.	do.	Clay.	do.	do.	do.	do.		64.9	63.5	64.7	64.3	65.9	69.1	69.3	80.6	65.7	76.7
49	Edw. Hicks, Old Westbury, N. Y.	'78	Snd. loam.	do.	do.	Loam.	Corn.			do.		45.2	60.0	54.0	37.8	54.3		57.3	76.0	48.3	66.8
50	Chester Sage, Middletown, Conn.	'79	Gr. loam.	Compact.	do.	do.	Meadow.			do.		42.0	49.2	46.0	59.0	41.1	58.0	63.4	60.8		44.3
51	H. C. Loose, Hagerstown, Md.	'79	Calcar'us.	Loose.	do.	Clay.				do.		48.7	52.0	61.0	54.5	47.5	48.5	68.5	75.5	64.0	
52	James D. Winslow, Pittsford, Vt.	'79	Sandy.	Light.	do.	Sand.	Meadow.	Var.	Var.	do.		41.7	59.6	42.2	41.1	57.0	37.0	60.0	60.0	37.5	51.4
53	W. H. Philbrook, N. Hampton, N. H.	'79	Gravelly.	do.	do.	Gravelly.	do.	do.	do.	do.	40-50 bu. unm'd	44.0	60.0	73.8	56.2	65.0	57.5	61.2	81.2	45.0	
	POTATOES.																				
54	Prof. W. H. Jordan, Orono, Me.	'78	Heavy cl.	Compact.	Wet.	Heavy cl.	Potatoes.	Cold.	Wet.	Unf.		27	47.0	33.0	73.0	47.0	59.0	111.0	129.0	35.0	116.0
55	W. I. Bartholomew, Putnam, Conn.	'78	Loam.		Med.	Compact.	Meadow.	Med.	Med.	Fav.		139	162.0	200.0	135.0	210.0		220.0	250.0	150.0	
56	do. do. do. do.	'79	do.	Loose.	do.	do.	do.	Cold.	Wet.	Unf.		42	32.0	62.0	35.0	96.0	42.0	98.0	109.0		56.0
57	Edw. M. Snow, Lunenburg, Vt.	'79	Dark lo'm.	do.	Dry.	Loam, cpt.	Oats.	Var.	Var.	Fav.		57	45.0	136.0	49.0	117.0	44.0	145.0	172.0	41.0	
58	Chas. H. Cole, Lunenburg, Vt.	'79	do.	Medium.		do.	do.					159	180.0	175.0	215.0	220.0	260.0	360.0	370.0	150.0	170.0
59	James K. Toby, Calais, Vt.	'78	Loam.	Loose.	do.	Compact.		Cool.	Dry.	Fav.		188	127.0	127.0	136.0	154.0	122.0	115.0	198.0	132.0	139.0
60	R. P. Walcott, Holland Patent, N. Y.	'78	do.	Light, l'se.	do.							105	102.0	105.0	110.0	150.0		162.0	185.0	100.0	115.0
61	S. W. Crocker, St. Albans, Me.	'78	do.	Light.	do.	Hardpan.	Meadow.	Var.	Var.			60	76.6	100.0	93.3	106.6		150.0	170.0	93.3	146.0
62	Zeno Benson, Bridgewater, Mass.	'79	do.	do.	do.	Loam.	Pasture.	Warm.	do.	Fav.		46	67.0	91.0	46.0	84.0	45.0	79.0	124.0	60.0	53.0
63	Hiram A. Cutting, Lunenburg, Vt.	'78	Yell'w lm.	do.	do.	Hardpan.	Meadow.		do.	Unf.		33	40.0	80.0	20.0	100.0	60.0	100.0	140.0	60.0	80.0
64	J. H. Stiles, Morris Plains, N. Y.	'78	Snd. loam.	Light, l'se.	Med.	Cl. h'pan.		Var.	Wet.	do.		31	80.8	38.4	69.0	37.2		76.4	75.6	51.6	
65	J. R. Kinerson, Peacham, Vt.	'78	do.	do.	Dry.	Sandy.	Meadow.	do.	do.			133	138.9	156.0	160.0	149.0	137.0	165.6	200.0		
66	E. G. Rice, Spring Garden, Pa.	'79	Calcar'us.	Light.	Med.	Clay.	do.	Cold.	Dry.	Unf.		62	59.0	67.0	66.0	53.0	56.0	53.0	52.0	63.0	
67	John Labrum, Lee, Mass.	'79	Calc. gr.	do.	Dry.	Calc. gr.	Pa ture.		Wet.	do.		45	56.0	52.0	72.0	54.0	66.0	88.0	98.0	60.0	
68	P. M. Reidsbough, Glen Rock, Pa.	'79	Gravelly.	do.	do.	Clay.		Var.	Dry.	do.		29	85.0	69.0	38.0	84.0	55.0	76.0	72.0	55.0	76.0
69	Seth P. Rising, Rupert, Vt.	'79	do.	Loose.	do.	Gravelly.		do.	Var.	do.		80	105.0	110.0	175.0	94.0	125.0	80.0	145.0	90.0	120.0
70	Henry Arey, Yarmouthport, Mass.	'79	Snd. loam.	Light.	Dry.	Yel. sand.	Corn.	Warm.	Dry.	Fav.			133.0	152.0	140.0				213.0		182.0
71	Moody P. Marshal, Lancaster, N. H.	'78	Stony.	do.	Med.		Oats.			do.		141	133.0	165.0	209.0	206.0		247.5	270.4	158.0	215.4
72	do. do. do.	'78	do.	do.	do.		do.					121	117.0	168.0	214.0	176.0		145.0	167.0	123.0	170.0
	SWEET POTATOES.																				
73	A. P. Arnold, Vineland, N. J.	'78	Snd. loam.	Loose.	Dry.	Sand.	Corn.		Var.	Unf.		68	91.0	77.0	110.0	93.0		166.0	177.0	60.0	
74	do. do. do.	'78	do.	do.	do.	do.	do.		do.	do.			120.0	130.0	140.0	120.0		140.0	170.0		
75	M. Cheseboro, Mandarin, Fla.	'78	Sandy.	Compact.	Mod.	do.	Potatoes.					40	159.0	79.0	189.0	92.5		92.5	212.0		
76	Chas. Parry, Cinnaminson, N. J.	'78	do.	do.	Dry.	Snd. & gr.	Asparagus					73	141.0	73.0	194.0	145.0	194.0	218.0	290.0		290.0
	TURNIPS.																				
77	Prof. J. R. Farrington, Orono, Me.	'78	Clay.	Compact.	Moist.	Cl. h'pan.	Meadow.					225	285.0	315.0	240.0	428.0	263.0	413.0	518.0	363.0	400.0
78	James H. Toby, Calais, Vt.	'78	Loam.	Loose.	Dry.	Compact.	Potatoes.	Cool.	Dry.	Fav.		516	565.0	615.0	563.0	598.0	661.0	656.0	785.0	679.0	680.0
79	H. M. Swift, Chestnut Ridge, N. Y.	'79	Gr. loam.	Coarse.	do.	do.	Grapes.	Warm.		do.				242.0		151.1		194.4	201.6		242.0
	OATS.																				
80	Dr. H. A. Cutting, Lunenburg, Vt.	'79	Loam.	Light.	do.	Gravel.	Potatoes.	Cold.	Wet.	Unf.		15.6	15.3	45.6	10.0	58.7	54.4	28.1	40.0	27.3	38.0
81	S. D. Burrows, Basking Ridge, N. J.	'79	Snd. loam.	do.	do.	Clay & gr.			Dry.	Fav.		33.1	31.9	32.5	25.6	45.0	30.0	31.9	43.1	22.5	
	COTTON—POUNDS PER ACRE.																				
82	J. J. Dearing, Covington, Ga.	'79	Red clay.	Compact.	Dry.	Red clay.						104	38.	242.	66.	599		457	693	44.0	
83	do. do. do.	'79	Grey land.	Light.	do.	Porous.	Cotton.		Wet.	Unf.						1201	819.	1035	1023		
	SUGAR BEETS.																				
84	Henry Lane, Cornwall, Vt.	'78	Clay loam.			Shte rock.	Onions.					795	1053	1174	852	1116	988.	1091	1119	984	
	COW PEAS.																				
85	Willard R. Hall, Albion, Fla.	'78	Sandy.	Light.	Dry.	Yel. sand.						3.0	4.0	5.0	6.0	6.0		8.0	10.0	4.0	

(1) "Grey land." * In experiments, 5, 6, 9, 21, 22, 50, and 56, only 150 lbs. per acre were applied. † Including market price plus $5.00 per ton for freight.

No. 3, as the experiment will be more conclusive.

It is particularly recommended that other fertilizers than those in the sets be applied on parallel plots of exactly the same size.

"As to crops, a large majority of the expermenters have heretofore selected Corn and Potatoes, probably because they are easy to manage, but more trials made with Grain, Grass, Sorghum, and Root Crops, and in the Southern States, Cotton, Sugar Cane, and Cow Peas, are particularly desirable. The need of more information about all our staple crops, and the best way to grow them is imperative. The accounts already given have shown how useful these experiments are, and those who make and report them well are public benefactors."

To the experimenters of last season we especially urge the importance of repeating the trials through a series of years. We trust as many as can will continue their good work, and report results.

How to Procure the Fertilizers.

No profit to any one is involved in this scheme; those who supply the fertilizers do so at the bare cost (or less); while some articles have advanced since last year, they do not increase the price of the experimental sets; they look for their profit in the increased sales of fertilizers that must naturally follow. The *American Agriculturist* receives not a cent for its share of the work, but will find its profit in the increased prosperity of the farmers who turn the experiments to the best account. It is, of course, supposed that every farmer sensible enough to try experiments, is a reader of the *American Agriculturist*, yet we would say that the offer is not confined to these, but is open to all. The parties who furnish the sets are (placed alphabetically):

Henry J. Baker & Bro., 215 Pearl St., New York.

Bowker Fertilizer Co., 43 Chatham St., Boston, and 3 Park Place, New York.

Mapes' Formula and Peruvian Guano Co., 158 Front St., New York.

These are all first class houses, who will each put up precisely the same articles, and our readers may send their orders (accompanied by the cash) to any one of them. If any prefer to send their orders to this office, we will hand them to the dealers, referring to Boston those which can be best served from that point.

We have only to ask that each farmer study carefully the directions and the Pamphlet accompanying each set, that he may have a clear idea of what he is expected to do in order to make his experiments useful to himself, and consequently, to others.

Science Applied to Farming—LVI.

General Results of the Farm Experiments.

The Table on page 136 gives examples of the experiments with fertilizers in 1878 and 1879, and the one on this page general averages of results. I commend their study to all thoughtful farmers.

1. It must be remembered that the trials were not only subject to all the vicissitudes of weather and season, but were made on soils of all sorts, but mostly very much run down. The directions were to select worn out soils. Hence the average results with a given crop do not fairly represent what might be expected on soils adapted to its growth and in average condition.

2. As would be expected, the results of the two seasons agree in the main, though with the less favorable weather of 1879 the crops averaged less than those of 1878.

The Effects of the Different Fertilizers.

3. The "Complete Chemical Fertilizer," the mixture of 300 lbs. Superphosphate, 150 to 200 lbs. Potash Salt, and 150 lbs. Nitrate of Soda, costing $15.38 per acre (including $5 per acre for freight), brought the largest crops, excelling even the farm manures with all the crops on which the number of experiments is large enough for a fair comparison. But it must be remembered that this mixture was proposed to test soils and not to bring large yields, and does not show how well chemical fertilizers may do. The "complete fertilizers" prepared by reliable dealers for special crops, are of course more appropriate for them and would give better results than the mixture.

4. The mixture of superphosphate and potash salt, costing $9.25 per acre, brought a trifle less corn and decidedly more potatoes than farm manures.

5. The mixture of nitrate of soda and superphosphate, which corresponds closest of all to the ordinary ammoniated superphosphates, fish manures, and guano, though costing more than the mixture of superphosphate and potash salt, brought less increase of corn, potatoes, turnips, sweet potatoes, and indeed of every crop but oats. The number of experiments with oats, however, is too small for any general conclusions. It is very probable that they and the cereals generally would be more helped by nitrogen, and less by potash, than the other crops. But it is a question whether manufacturers of ammoniated phosphates would not do better to substitute potash salts for the nitrogenous materials in compounding their fertilizers, at least for some crops. The mixture of nitrate of soda and potash salt the least efficient of all.

6. As to the efficiency of the materials separately, the nitrate of soda by itself was seldom of much use, the sulphate of lime was frequently, the muriate of potash very often, and the superphosphate generally profitable. Doubtless considerable of the effect of the superphosphate was, in many cases, due to the sulphuric acid and lime.

7. As to the effect of ashes, the results are variable, though generally they were efficacious.

8. One of the chief defects of these experiments is that so few parallel trials with lime were made. There are many cases in which a dressing of lime is the cheapest and best means of improving the land.

Artificial Fertilizers vs. Farm Manures.

9. Not only did the "Complete Chemical Fertilizer" bring a larger average increase than farm manures as actually used; and the mixture of superphosphate and potash salt nearly as large average increase, but the quality of the crop was generally better with the chemicals than with the farm manures. Potatoes, especially, were finer in quality and less disposed to rot with the artificial fertilizers than with the farm manures.

As to Mode of Applying the Fertilizers, Whether Broadcast, or in the Hill or Drill.

The results are on the whole against applying in the hill or drill. The best results in the majority of cases came when the fertilizers were sown broadcast. Several of the very best were where the materials were scattered over a strip a couple of feet or so wide along the rows. Many of the worst results came when the fertilizers were put in the hill or drill. The nitrate of soda and potash salts thus applied often injured the crops, especially in dry weather.

Effects of the Fertilizers on Different Crops.

10. Potatoes and turnips responded most profitably to the "Complete Fertilizer," in nearly every case. Corn, on the other hand, was largely helped by the superphosphate and potash salt, but received little benefit from application of nitrogen in any form.

The Feeding Capacity of the Plants.

11. The experiments imply that the Corn was some how able to gather nitrogen from natural sources, provided it had enough of the mineral ingredients at its disposal. They do not tell how much of the nitrogen came from the roots of the preceding crops, how much from other nitrogen compounds in the soil, and how much from the air. They imply that potatoes possess in far less degree than corn the power of gathering sufficient supply of either nitrogen or the other ingredients of its food from soil and air. They imply that turnips are generally unable to obtain enough phosphoric acid from the soil, and are greatly helped by it in fertilizers; that without its application they usually get but little good from other materials; that with it alone they can generally gather but a partial supply of the other materials of their food; and that for a full yield considerable quantities of all the soil ingredients of plant food are needed close at hand and in available forms. But except on corn and potatoes these experiments are still too few for reliable data.

The Best Fertilizers for Different Crops.

12. The most profitable material in a given case is that which is best fitted to its needs. The chief factors of the problem are: *first*, soil; *second*, season; *third*, feeding-capacity of the crop, its power to gather its food from soil and air; *fourth*, form of combination of the ingredients of the fertilizers; *fifth*, the indirect action of the fertilizer.

Soils vary in respect to the plant food they supply in available forms. Phosphoric acid is most often deficient; next come potash and nitrogen; then, lime and sulphuric acid, and rarely magnesia. But the infertility of soils is due to physical causes perhaps nearly as often as to chemical. Soils often do not have the proper texture, they are too compact or too loose; or they lack absorptive power, they cannot retain the plant food until plants use it but suffer it to be leached away by drainage water; or the moisture supply is bad, they are too wet or too dry. These defects are as fatal as lack of plant food. Many soils need amendments first and then manure. Drainage, irrigation, tillage, use of lime or muck are often the cheapest if not the only means for bringing up poor soils. *Season* counts for much, often for everything, in the action of manures.

The effects of the *forms of combination* of the ingredients, *i. e.*, of phosphoric acid in bone as compared with superphosphate, of potash as sulphate *vs.* muriate, were not tested. Nitrogen in different forms was used in some special experiments with, on the whole, the best results from Peruvian guano, next from a mixture of nitrate of soda, sulphate of ammonia and dried blood, and the worst from these last separately. As to the indirect action of fertilizers in improving the texture of the soil and setting its plant food free, the experiments have nothing to say, but we know that it often makes a large part of the usefulness of the fertilizer.

18. Leaving differences of soils out of account, and considering the average results of the experiments; the best among the materials used to produce large crops of *Corn* would probably be a mixture of Peruvian guano and potash salt, with perhaps the addition of some fine ground bone or superphosphate. The most profitable mixture would probably consist of muriate of potash with either superphosphate or fine ground bone, or both. In a number of special experiments on corn a mixture of 300 lbs. of superphosphate and 150 lbs. of muriate of potash, which can be bought in the larger markets for $7.50 to $8.00, brought on the average 50¼ bushels of shelled corn per acre.

14. For *Potatoes*, which responded well to all the materials, probably a mixture of Peruvian guano, or fish with potash salts would be generally profitable. For either corn or potatoes, nitrate of soda, sulphate of ammonia, dried blood, or better, a mixture of these, could be advantageously used to supply the nitrogen, and superphosphate or bone-dust or a mixture of the two, for the phosphoric acid.

15. The common impression among farmers that the best use of artificial fertilizers is to supplement farm manure is doubtless, in ordinary circumstances, correct. The right way is to make the most and best manure that is practicable upon the farm, and piece out with such commercial fertilizers as experiments and experience prove profitable.

16. I derive no formulas for fertilizers from these experiments. There are many cases in which complete fertilizers are in place and many more in which the farmer does not know what his soil and crops need.

Middletown, Conn. W. O. ATWATER.

Averages of Results of Experiments of 1878 and 1879.

Produce, Increase, and Gain or Loss per acre, with different Fertilizers and Crops.

Number of Plot.....	0	A	B	C	D	E	F	G	H	F M
Kinds and Amounts of Fertilizing Materials Applied per Acre.	No Manure.	Nitrate of Soda, 200 lbs.	Dissolved Bone Black, 800 lbs.	Muriate of Potash, 200 lbs.	Nitrate of Soda, 150 lbs. Dissolved Bone Black, 600 lbs.	Nitrate of Soda, 150 lbs. Muriate of Potash, 200 lbs.	Dis. Bone Black, 300 lbs. Muriate of Potash, 200 lbs.	Nitrate of Soda, 150 lbs. Dis. Bone Black, 300 lbs. Muriate of Potash, 200 lbs.	Plaster, 200 lbs.	Farm Manure.
Valuable Ingredients Applied per Acre.		32 Nitrogen, 1bs.	48 Phos. Acid, lbs.	Potash, 100 lbs.	Nitrogen, 24 lbs. Phos. Acid, 48 lbs.	Nitrogen, 24 lbs. Potash, 100 lbs.	Phos. Acid, 48 lbs. Potash, 100 lbs.	Nitrogen, 24 lbs. Phos. Acid, 48 lbs. Potash, 100 lbs.	Sulphuric Acid and Lime.	Complete Fertilizer, Variable.
Cost per Acre		$7.50	$5.25	$4.50	$10.25	$10.13	$9.75	$15.38	$0.80	variable
Av'rge Yield pr. acre	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.
CORN—53 Exp's in '78 & '79.	24.3	30.4	25.3	33.3	33.8	36.8	41.8	47.6	29.0	44.5
POTATOES—18 Ex. '78, '79.	75.4	89.1	106.1	107.4	105.2	94.3	127.2	150.2	87.6	133.2
‡ CORN, '37 Exper's { Produce		30.1	24.0	32.7	40.0	23.4	41.5	47.9	24.8	43.5
‡ CORN, '37 Exper's { Increase		8.8	12.7	17.4	18.7	2.1	20.2	26.6	3.5	21.2
‡ POTATOES { Produce	75.0	85.7	97.9	109.0	114.8	92.0	134.9	156.6	67.3	13.9
‡ POTATOES { 14 Exper's { Increase		10.7	22.9	34.0	39.8	17.0	59.9	81.6	12.3	56.9
SWT. PO'S—4 Exp's in '78.	58.7	127.7	99.7	136.2	115.1	194.0	154.1	214.3	60.0	230.0
TURNIPS—3 Ex. in '78, '79.	245.0	283.0	291.0	274.0	291.0	288.0	401.0	501.0	313.0	374.0
SUG. B'TS—1 Experiment	795.3	1013.3	1174.0	851.4	1116.0	988.8	1090.6	1118.6	960.6	
OATS—8 Experiments....	19.4	23.6	21.6	17.8	51.8	43.2	30.0	41.8	25.2	26.9
Av'r'ge Inc'e pr acre										
CORN—53 Experiments...		6.1	10.9	9.0	14.5	13.5	17.5	23.3	4.7	20.2
OATS—3 do.		4.2	2.2	1.6	32.4	22.8	10.6	22.4	5.8	7.5
POTATOES—18 do		13.6	30.7	32.0	33.8	18.9	61.8	76.8	12.2	76.8
S. POTATOES—4 do.		71.0	31.0	99.5	56.4	133.5	98.4	185.5	1.3	231.3
TURNIPS—3 do.		38.0	146.0	29.0	146.0	43.0	156.0	256.0	67.0	129.0
SUG. BEETS—1 do.		218.0	378.7	56.0	320.7	193.0	294.8	323.8	164.8	

Gain or Loss per Acre.

	No	A	B	C	D	E	F	G	H	G
CORN.....	5	†1.54	1.30	1.10	8.62	†0.38	13.38	5.51		
	6	†6.03	17.47	†5.89	15.76	†9.80	18.50	15.73		
	7	†8.55	†5.63	†6.09	†7.45	†5.65	†4.35	†3.62	4.49	16.94
	9	3.71	†0.74	34.0	†0.17	31.68	33.57	34.40		
	16	†1.12	9.99	†12.58	21.69	17.43	21.08	46.55	2.55	†1.08
	22	1.95	1.85	6.25	5.02	12.52	10.47	8.22	6.65	
	24	0.94	†1.25	†1.05	†10.50	4.60	9.30	1.49		
	27	0.86	13.85	†2.20	12.30	†5.62	15.25	7.14	†2.36	1.95
	57	†5.31	†12.44	†9.41	14.25	30.60	†6.94	27.73	0.47	
POTATOES.....	61	0.50	20.60	19.60	18.00	51.70	59.50	25.50		
	63	†8.17	†5.67	6.66	†7.00	†12.34	0.33	13.33	3.16	
	69	25.80	18.59	7.22	27.59	6.52	19.37	11.61	14.34	†7.12
TURNIPS.....	77	3.37	14.75	†4.88	35.37	†20.12	33.87	52.62	6.50	
SWEET POTATOES.....	74	52.0	59.0	65.00	48.00	59.00	68.00			
OATS.....	80	†0.74	10.83	†7.22	12.48	†2.09	11.05	0.62	6.02	

* As calculated by the experimenters by subtracting the cost of fertilizers, freight, and applying, from value of increase over no manure. † Loss.

‡ Including only those in which farm manures were tested with the chemical fertilizers.

A Farm House Costing $1,500.

BY S. B. REED, ARCHITECT.

These designs are for a substantial country dwelling, arranged to meet the requirements of farmers in moderate circumstances, and give as much accommodation and convenience as can well be done for the sum named. [This design, which was made

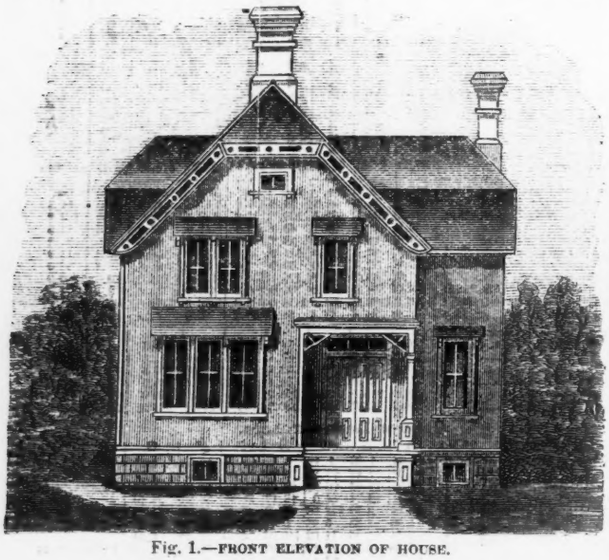


Fig. 1.—FRONT ELEVATION OF HOUSE.

to meet certain requirements, has many excellent features, but were we to build such a house we should, instead of the limited porch, run a broad veranda or piazza across the whole front. Were this done, the space now occupied by the porch could be thrown into the Hall or Entry, which, in a country house, is often one of its most useful rooms. This of course would add a little to the expense, but would be money well invested.—EDS.]....**Exterior** (fig. 1).—The extreme ground measurements are 30 by 40 feet, giving a breadth becoming its relation as a farm house, with the surrounding grounds. The Foundations show 2 feet above the earth grades. Unless the site is already very high, the earth taken from the excavations should be used in raising the surface of the grounds at least one foot immediately surrounding the foundations, so as to turn away all

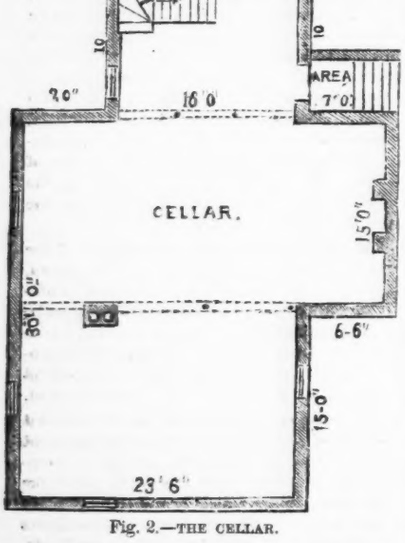


Fig. 2.—THE CELLAR.

water, and also to give increased hight and better appearance to the whole building. The simple methods shown in the treatment of the porches, windows, cornices, gables, roofs, and chimneys, give the whole a rustic appearance quite in accord with its domestic intent....**Cellar** (fig. 2).—Hight, 6½ feet; dimensions same as first story, giving abundant cellar room, which may be divided into separate apartments for vegetables and other uses. If there is a porous or sandy bottom, and proper ventilation, it will be sufficiently cool and dry for keeping fruit with good success. Six small windows built in the walls, afford light and ventilation to all parts. An opening in one of the flues of each chimney will carry off unwholesome vapors when the windows are closed in winter. There is an outside entrance under the rear porch, and an inside stairway leading to the rear entry on the first floor, with a door at the top. This location of cellar stairs prevents cellar odors and dust from coming by them directly into the body of the house....**First Story** (fig. 3).—Hight of ceilings, 10 feet. The front entrance is from a porch through double doors, to a hall which communicates with the parlor and kitchen, and contains the main stairs. The Parlor is square floored, with windows in two sides, and a marble shelf. The Kitchen is the largest apartment, and intended as the family living-room. It is convenient to a pantry, closet, and rear entrance. The Pantry is thoroughly shelved, and has a small window. The Closet is formed in the space under the front stairs, and is shelved. The Rear Entrance is from a covered porch to the Entry, the latter is sufficiently large to contain the wash-tubs, and relieve the kitchen of much of the heavy work. The Bed-room is conveniently arranged, and may be entered from the parlor or kitchen. It has two windows, a closet, and a marble shelf....**Second Story** (fig. 4).—Hight in main house, 6 feet at the plates, following the rafters to the full hight of 8 feet. The divisions embrace a hall, four sleeping-rooms, four closets, and a store-room and garret. The Chambers are commodious, have windows in two sides of each, and adjoin chimneys, giving opportunity for stoves when required. The Flues of the kitchen chimney are divided in the second story, admitting a window between, and are brought together over an arch above the window. A Tank shown in a closet fills half of its hight; the balance of the space may be used as a closet. The Store-room might be used as a bed-room if required, and receive light from the rear window through a sash door....**Construction.**—The excavations are made 3½ feet deep. The foundations and chimneys are of hard bricks and good mortar (or stone may be used where cheaper). Frame of sawed timber, as indicated in the estimate below. Siding of wide "Novelty" pattern. Principal cornices of dressed pine, projecting 18 inches, and having in the gables verge boards of open panel-work. Roofs are set at an angle of 45°, and covered with pine shingles laid on 1½ by 2-inch lath. Floors of tongued and grooved spruce, 8 inches wide. Plastering, white finish upon two coats of brown mortar. Stairs of pine. The principal flight having a newel, rail, and ballusters of black-walnut. The principal windows have four-light sash hung to balance weights. Cellar sash two lights hung with butts to swing upwards. Doors are panelled and molded, and have hard-wood saddles. The plumbing is similar to that described and illustrated in the March *American Agriculturist*. Marble shelves, with appropriate stucco trusses, are set in the parlor and each chamber. Painting inside and out, two coats of best lead and oil.....**Estimate.**—Cost of materials and labor.

141 yards Excavation, at 25c. per yard	$ 35 00
14,000 Bricks, Foundations and Chimneys, at $12 per M.	168 00
24 feet stone steps, at 12c. per foot	2 88
600 yards Plastering, at 25c. per yard	150 00
4,000 feet Timber (as follows), at $15 per M.	60 00
Sills 4x8 in., 144 ft. long. Plates 4x6 in., 90 ft. long.	
9 Posts 4x7 in., 17 ft. long. Girts 4x6 in., 38 ft. long.	
2 Posts 4x6 in., 10 ft. long. 14 Beams 3x8 in., 24 ft. l'ng.	
Ties 4x6 in., 175 ft. long. 30 Beams 3x8 in., 15 ft. l'ng.	
20 Rafters 3x4 in., 18 ft. l'ng. 5 Beams 3x8 in., 15 ft. l'ng.	
26 Rafters 3x4 in., 13 ft. l'ng. Porch 3x7 in., 21 ft. l'ng.	
2 Valleys 3x8 in., 16 ft. l'ng. Ridges 2x8 in., 52 ft. l'ng.	
100 Joist, at 15c. each	15 00
250 Wall Strips, at 11c. each	27 50
235 Siding, at 28c. each	65 80
Cornice materials	30 00
300 Shingling Lath, at 6c. each	18 00
45 bunches Shingles, at $1.25 per bunch	56 25

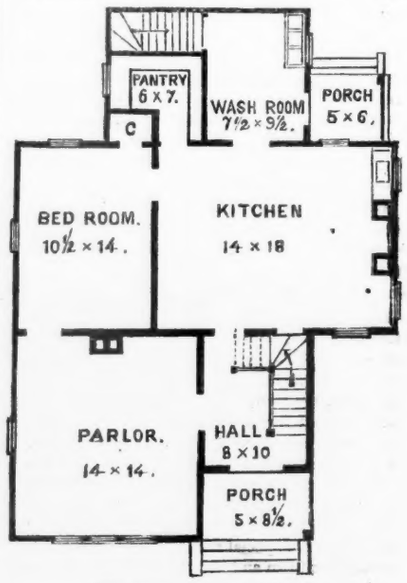


Fig. 3.—THE FIRST STORY.

200 feet Tin (in Valleys, Gutters & Leaders), at 10c. p.ft.	20 00
200 Flooring (inside), at 28c. each	56 00
18 Flooring (outside), at 25c. each	4 50
2 Stairs (complete)	40 00
2 Porches details (complete)	20 00
5 Cellar Windows (complete), at $3 each	15 00
20 Plain Windows (complete), at $7 each	140 00
21 Doors (complete), at $6 each	126 00
5 Marble Shelves, at $4 each	20 00
Closet finish (complete)	15 00
Plumbing, $40; Carting, $20	60 00
Carpenter's Labor not included above	175 00
Painting, $175.00; Incidentals, $4.07	189 07
Total cost	$1,500 00

Agricultural Art and Science.—Prof. W. H. Brewer, Yale College, in his address before the Am. Agr'l Association, spoke at some length upon the *Art of Agriculture* in distinction from the *Science of Agriculture*. The *Art* is old—almost as old as the race; it varies with the locality and the traditions of the times. The *Art* is *local* and *change-*

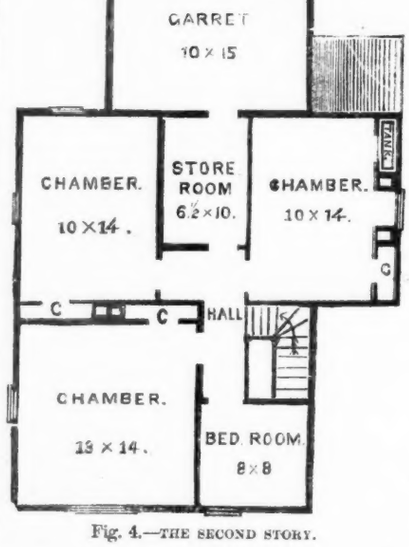


Fig. 4.—THE SECOND STORY.

able. On the other hand the *Science* is new—very young—and mostly confined to our own generation; it deals with principles that are *fixed* and *general*. When the art, that is, the practice of agriculture, is founded upon, and is the application of well founded principles—*Science*—then we may expect successful and progressive farming.

American Merino Sheep.

Sheep-raising has formed an important part of the husbandry of most nations from the early historical times. Each country has had its peculiar breeds marked by characters, due in a great degree to the modifying influences of climate, and in part to a rude selection. In some cases these breeds have reached a high degree of development, while in other countries the flocks have shown no improvement for centuries. This country, young as it is, has made its contribution to the list of useful breeds in the *American* Merino. Our climate and pastures have better satisfied the wants of this fine wool-bearing animal than those of its native country, and now the American Merino stands at the head of the fine-wool sheep of the world. This breed would seem to have reached that point in its development where it appears of but little use to try to further improve it. The first importations of Merino sheep into this country were made early in the present century, and consisted of very choice animals from the best families of Spain. The most extensive importations were those of Hon. Wm. Jarvis, the American Consul at Lisbon, in 1809 and 1810, who sent over nearly 4,000 head. From these Spanish sheep as a basis, and by means of careful crossing, breeding, and selecting from several distinct flocks, the present Merino has been produced, and is now so unlike other Merinos as to take rank as a distinct breed with the prefix "American." The accompanying engraving gives a group of these American Merino sheep. The ram, with his short, thick neck, straight and broad back, and general plumpness is an animal which unites a vigorous constitution with great beauty—as beauty is regarded in sheep—as seen in his fine head and pleasing outline. His wool is of medium length, thick and fine, and extending well down to the toes. It can not be said of him that he is "hide bound;" the much esteemed wrinkles being large and sufficiently abundant to annoy the shearers, and to entirely meet the requirements of breeders, who regard this mark as important in an animal with which to improve the smooth-skinned native sheep.

The sheep industry in the United States is vast and important, and in the consideration of which there are two partially distinct, and at the same time, interlocking interests. Sheep were in early times grown almost solely for their wool, and with the annual shearing came the year's income; but in later times, and never so prominently as now, the carcass is looked upon as an important item in sheep husbandry. Mutton as a cheap and acceptable meat has of late grown greatly in popularity, and mutton now stands as one of the two important factors in the successful raising of sheep. In view of the fact that the Merino is essentially a wool-producing breed, with a fleece of the finest and best quality, it is evident that the pure-blood Merino, though it may supply our manufactories with the material for the finest of woollen goods, on the other hand it can not satisfy the butcher. The sheep having to both feed and clothe its keeper; it is an important question: What is the best breed of sheep to do this? Evidently not the pure-blood Merino. Though the growing of pure-blooded Merinos has its place, and an important one, and the demand for their wool indicates the prosperity of manufacture of the finest goods, it is in the crossing of them with other breeds in which the flesh-producing qualities predominate, that a sheep best for both meat and wool is produced. A cross-bred is the one that in most localities is to pay. The Merino is slow of growth and small of carcass when mature; but when crossed with a rapid grower, one that matures early, is a high feeder, and lays on flesh rapidly, but not remarkable for its wool either in quantity or quality, a sheep is obtained that pays for itself in its wool of prime quality, and furnish a good quantity of mutton as a profit. Of such character are the crosses of the Merino with the Cotswold and the South-down. But with the great mass of American sheep on the western plains, wool is the important product, and here the cross must be with the Merino upon the "Native"—a race of sheep which has grown out of a variety of early importations to this country—an intercrossing of various breeds in which many of the good points have been lost. In this field the Merino has a great work to do to raise the yield of wool 1, 2, or more pounds per head, and give it a higher value. The opportunity for the increase of our sheep interest is almost without limit, so far as favorable conditions of vast plains and healthful climate is concerned, and with our present large importations of woollen goods it is certain that no raw wool would lack for a market. There are many places where sheep may go and thrive that cattle and other life-stock dare not tread; and it should be the ambition of sheep-raisers to fill all these places with sheep adapted to these conditions, in the production of which the pure-blood Merino must find its full share of work. The revival in the sheep interest that is now in progress is both healthy and permanent. The surplus of wool and woollen goods is exhausted, and the growing crop is in demand. The shipping of whole car loads of Merino rams to the flocks of the great West, with calls for more than the East can supply, is not in the nature of a "boom," but founded upon the demands of the time and the merits of the breed.

A GROUP OF AMERICAN MERINO SHEEP.

The rapid growth in our sheep industries is shown by the figures given by George Geddes in an article in the New York "Tribune" for February 26:

"In 1836 our production of wool was 42,000,000 pounds; in 1860 it had increased to 60,000,000. In 1867, the annual production had risen to 147,000,000 pounds, and in 1877 to 208,000,000, that is from

1860 to 1877, inclusive, the increase was at the rate of 246 per cent, while in the preceding twenty-four years, the increase was about 40 per cent.

"Since 1809 our improvement in the sheep that produce clothing (fine) wool has been very great. Then 9¼ per cent of unwashed wool to the live weight of the animal was the standard; in 1864 the best recorded yield was 21 per cent, and the heaviest fleece 27 pounds. Three rams bred since 1873 in Vermont have yielded fleeces averaging 27.3 per cent of unwashed wool, while the average weight of the fleeces of the rams was 34⅓ pounds.

"Wool yielded by cross-bred Merino and mutton sheep is held by the manufacturer to be of great value, producing a combing wool that gives softness and cloth-like character to our fabrics not found in those abroad, as admitted by the best London and Paris tailors. We are now raising good mutton and supplying a rapidly increasing market. In 1839, on the great market day before Christmas, 400 sheep fully stocked the market at Brighton, near Boston, Mass. Last year 272,000 sheep and lambs were slaughtered at the Brighton Abattoir, 20,000 of them coming from Kentucky.

"Capital employed by manufacturers is nearly $300,000,000 giving work to nearly 200,000 persons.

"The importation of wool in the form of manufactured goods is rapidly falling off. In 1860 our importation amounted to $37,973,190. In 1878, our population having increased not less than 12,000,000, we imported only $25,230,154. In certain classes this falling off of importations is very marked. In carpets the importation in 1878 was not one-fourteenth the value of the importations of 1872. Dress goods, in which the foreigners still lead our manufacturers in the estimation of certain wealthy consumers, are no longer imported as extensively as formerly, their value having fallen in 1878 to $12,000,000 from $20,090,000 in 1872.

"The wonderful progress made, to the great benefit of the whole Nation, is before us, and our flock owners having surmounted the difficulties of changing the flocks of the East into producers of long wool and mutton, and transferring the production of fine wool to the West and Southwest, we look forward to profitable production of wool, combined with mutton, in New-England, as has long been the case in Old England, and abundant rewards to the owners of flocks of fine-wooled sheep in their new homes. In view of the foregoing facts, may not the wool-growers and the wool-manufacturers justly claim that they have largely contributed to the balance of trade in our favor, and to the ability of the Nation to resume specie payment?" The above facts and figures are worthy of study.

Among the Farmers.—No. 51.

BY ONE OF THEM.

Sam Stone's Horse-Shoe.

There is one brawny wielder of the hammer and draw-knife who studies his trade and loves it, tempering horse-shoeing with humanity. I will tell about him by and by—but first, do all my readers know what a delicate and beautiful *box* a horse's hoof is? The *box*, figure 1, is in external form a segment of the base of a cone, tough and elastic. The sole of the foot is attached to it in such a way that it has a free up and down play with every step—bringing the frog down to a bearing upon the ground. This substance, which is called a *frog*, and indeed the sole and frog together, are not intended to sustain the whole weight of the horse, as is evident from the fact that every horse winces when forced to tread with his whole weight upon them, as when he steps upon or picks up a stone. Figure 2 shows a longitudinal cross-section of a horse's foot, and the relative position of the frog, sole, laminæ and shell. His weight is chiefly borne by the horny shell—and one who has not studied the horse's hoof will be surprised to find that the weight of the horse is really *suspended* from the inner walls of the hoof by delicate curtains, or leaves of horn, called the *laminæ*. They form the entire inner surface of the hoof walls, and are enclosed, each one by itself, in a vascular membrane, and so closely connected with the half moon-shaped bone, called the *os pedis*, which is the supporting bone of the column of the leg, that at times the laminæ of one foot support almost the entire weight of the horse, for the weight is borne very slightly upon the sole in most cases. There are about 500 laminæ (so the books say,) in each foot, in all four feet, 2,000, of course, so that the weight which each one of these many thin laminæ has to bear is only a pound or so at the most.

I am led to this explanation of the mechanical construction of the horse's hoof, not on account of the beautiful adaptation of the structure to resist the jars and blows which it gets in daily use, but rather to enforce the great importance of sound hoof-walls, and to describe a shoe which I have had in constant use for some months.

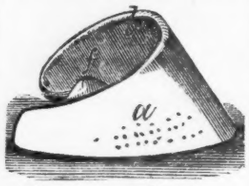


Fig. 1.—HORSE'S FOOT.

We all know that in icy weather horses must have sharp calks, and this is especially true in cities where the pavements are much more slippery in winter than in summer. Calks in horses' shoes are very soon worn down flat, or pounded smooth, so that the shoe has to be taken off, new calks put on, or the old ones sharpened, and the shoe nailed again upon the foot. The hoof-walls, which we have seen support nearly the whole weight of the body, are thus weakened or destroyed by the nail-holes, (fig.1, *a*), and the horse sometimes rendered useless until a new horn has grown out upon the foot. A more frequent result is that the shoes tear off or are "thrown" or "cast" off, and the animal is not unfrequently strained by slipping, or his hoof further injured before the horse can be re-shod.

The shoe I have been using avoids all this, in no new way in one particular—but quite new in another. There are calks provided which screw into the shoe, there being two toe-calks and one in each heel, making four to each shoe, fig. 3. This is an ancient device, and one which has worked very well for 100 years for aught that I know. These screw calks, of soft iron, wear down smooth in half a day's service, and then slip badly. Steel ones have been used, and these last longer, but do not hold so well upon pavements. The practice prevailed among some of changing one calk every day or two, so that the horse may always depend upon one to hold from slipping on each foot.

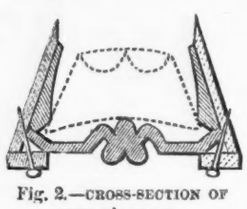


Fig. 2.—CROSS-SECTION OF HORSE'S FOOT.

Mr. Stone's improvement consists in making an iron calk with a small steel core, fig. 4. In use, the iron, being soft, wears away, and the steel maintains the point in good form a long time. When they wear they are of course replaced, one at a time preferably, though it makes little difference, as all remain sharp. My horse, which has worn this shoe, has been shod but once this winter, but his calks have been renewed several times. My attention was directed to these shoes by Mr. J. B. Olcott, the Agricultural Oracle of the "Connecticut Courant," who has used them for eight winters. He writes very enthusiastically about them, and I must say I do not think him at all extravagant.

Fig. 3.—THE SHOE.

Right Angles.

In laying out a new line of fence, staking out for a foundation, and in doing a thousand and one things, we have to lay off right angles, or it would be better if we would, rather than to guess at them. Most of us remember the "asses' bridge" of the geometricians—that "the square of the hypothenuse of a right-angle triangle is equal to the sum of the squares of the other two sides." If one has a ten-foot pole—or a tape line, or even no measure at all but a bit of pack thread, he can lay off his right angle with great accuracy. The numbers 3, 4, 5, give the sides of the triangle. See figure 5. *A*, *B*, is the base line. The point *C* is fixed. Measure off *three*

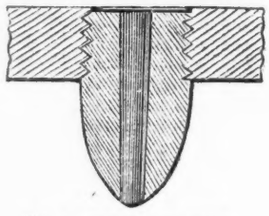


Fig. 4.—SECTION OF CALK.

anythings (feet, yards, five-foot or ten-foot lengths), and drive a stake at *D*, then measure off *four* lengths from *C* and *five* lengths from *D*, and thus determine the point *E*, which will be in a line at right angles to the line *A*, *B*, at *C*. This is absolutely a right angle, as may be proved practically

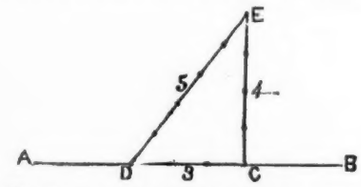
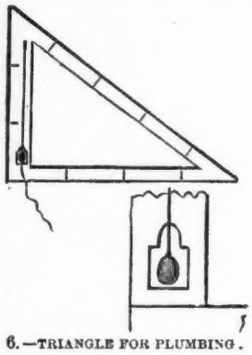


Fig. 5.—PLAN FOR GETTING A RIGHT ANGLE.

by putting another point on the line *A*, *B*, the other side of *C*, and finding that the distance to *E* will be the same as from the first *D* to *E*.—Three times three is nine; four times four is sixteen; nine and sixteen is twenty-five—which is also five times five. On the same principle one can nail three furring strips together for a big "square," to get levels or to secure perpendicularity in posts, stanchions or erections of any kind—or to mark out right angles upon the ground. One or both of the sides forming the right angle must be arranged for a plummet or "plumb bob" as the workmen call it, as shown in figure 6.


6.—TRIANGLE FOR PLUMBING.

Cooling and Ventilation of Milk and Cream.

While it is quite true that the utmost care as to the food which cows eat, and in the matter of stables and milking does not suffice to remove entirely what is known as the "cowey odor," it is a fact that a great part of it may thus be avoided, and that proper rapid cooling and ventilation of milk while cooling is of the greatest service in improving the flavor, and securing longer keeping qualities in the milk, the cream and the butter. A ventilated can or pail cover for milk placed in pools or in springs for cooling was introduced somewhat last year. This consisted of a tolerably close fitting cover having a large tube, four or five inches high in the top. This tube is divided perpendicularly by a *septum* or partition making virtually two tubes. One of these is closed at the top, but has a large opening in the side to the outer air, which is covered with wire gauze. The opening of the other half of the tube at the top is covered also with gauze (see fig. 7). So long as the

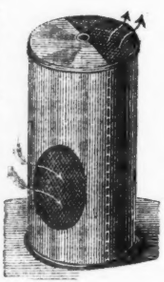


Fig. 7.

milk is warmer than the surrounding air, the air blows in, circulates over the milk and passes off, following the direction indicated by the arrows.

This top is useful for milk set in pools or springs to cool, or for milk set for cream to rise. The milk being perfectly protected from insects, animals and dust, or foreign matter of any kind, while a free circulation of air is passing over its cooling surface so long as the milk is warm at all.

A Milk Stirrer.

Mr. J. C. Long, of Orange, added for his own use an improvement to this useful invention, rendering it a perfect and rapid means of cooling milk.

This is a *Stirrer*, which is simply a disc of tin from which a long stiff wire rises and passes through the ventilator in a small tube made for the purpose. By means of this wire the tin disc, which is 4 to 6 inches in diameter, is moved up and down through about three inches space in the bottom of the can or cooler—the down strokes being quick and strong. Three strokes are sufficient to change all the milk in the can, causing that at the bottom, and coldest, to be stirred through all the rest.

If more milk is to be added the top is slid off half way and is held by the stirrer-wire. Figure 8 shows a 40-quart can of the modern kind, supposed to be standing in a spring or tub of ice water.

A Cream Can.

Cream, as taken from the pans, coolers, or other milk-setting vessels, always contains a notable

Fig. 8.—A 40-QUART CAN.

quantity of milk which separates from it in the course of a few hours. If cream is sold as such, it should be solid cream, of course. There are two ways for getting solid cream—dipping it out of the cream jars or cans, or drawing the milk from under it. The latter mode is preferable.

I have in use a cream can which holds six or seven gallons (see fig. 9). It is provided with the ventilating cover and stirrer just described, and has a window at the bottom to show how much milk separates. At the bottom there is also a spout, closed by a cork. Whenever cream is added, the whole mass, new cream, old cream, and milk, are stirred together, by a few dashes of the stirrer. This cream holder may be kept cool by being placed in water, or by having lumps of ice laid upon the top, and thus the cream freed from

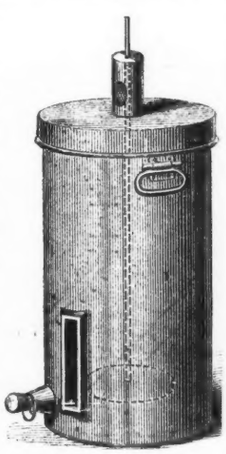


Fig. 9.—A CREAM CAN.

milk is ventilated and kept sweet at the same time. When cream is to be ripened for churning, it should be kept at a temperature of 60 to 63 degrees until it turns slightly sour. This cream-holder, when used for this purpose, may be set in lukewarm water, in a warm room, or upon hot water or steam pipes, where such means of heating are used. Where either of these can be had and controlled, it would be very convenient to have warmers made for the purpose, to be placed under the cans (see fig. 10). This warmer being connected by a rubber tube to the hot water tank, or pipe, would be kept at any desirable temperature by allowing more or less water to flow through it.

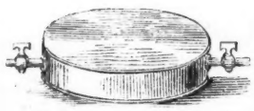


Fig. 10.—CREAM WARMER.

The best way of ascertaining the temperature of milk or cream, is by means of a floating thermometer. One advantage which the Stirrer described offers, is that the milk may be thoroughly stirred while the thermometer floats in it without its receiving any injury; further the test is more accurate.

Gilt-Edged Butter.

There is no doubt that much of the present improvement in the quality of butter is due to recent methods of setting milk, churning the cream, and preparing the butter for packing; and these are a natural outgrowth of the factory or creamery system of dairying. It is a notable fact that the highest-priced butter on the general markets is that from creameries, in which every new and improved device for aiding in butter making is tested and used if found worthy. The dairy system gave way to that of the creamery, because no single dairy could afford to procure the needed machinery and skill for producing the finest butter. But now a small dairy can find it profitable to use the most modern appliances because these are adapted for all uses, and to furnish the dairy of one cow or the factory of 1000. For setting the milk there are the deep-can and the shallow-pan creameries, and it is an undecided question among dairymen which of these two systems is the better. Premium butter has been made on each system, and the question is really nothing more than one of convenience and inclination, not to say prejudice. The Cooley System of deep setting, with submerged cans, is an excellent one for those who prefer the deep cans. A new and shallow-pan creamery, which cannot fail to please neat and ambitious dairymen is the Ferguson Bureau Creamery. This is so arranged as to provide every facility for cooling the milk in the summer or warming it in the winter, for preserving the milk free from dust, and for aërating and exposing it to the light. It is provided with glazed doors, and with ventilating openings which are protected by gauze covers, and is not only very convenient for its purposes, but a neat, if not handsome, piece of furniture for the house, dairy, or butter factory. The pans are square, of different sizes, and about 6 inches deep. An arrangement is made for drawing off the milk from the bottom of each pan. But it is upon the churning that the character of the butter chiefly depends. Of the great variety of churns there are but few which give general satisfaction, and still fewer with which butter can be completely made and prepared for packing in the churn. In figure 1 we give an engraving of butter made by the new method of churning without dashers. It will be noticed that this consists of small grains of the size of sago grains, loosely aggregated together. The butter from which this drawing was made was churned in the Rectangular churn (shown in figure 2.) As this is revolved by two opposite angles, a very complete agitation of the cream is secured, and 8 to 12 minutes is sufficient to bring the butter, in the condition shown in the engraving. The butter lies so loosely in the churn that the buttermilk can be drawn off from an opening at one of the angles, and cold water being poured in; by revolving the churn a few times, the butter is thoroughly washed, and freed from the buttermilk. A method of washing butter with cold brine, we believe, when in this condition, has been patented; of the justice of the claim to a patent on this so-called

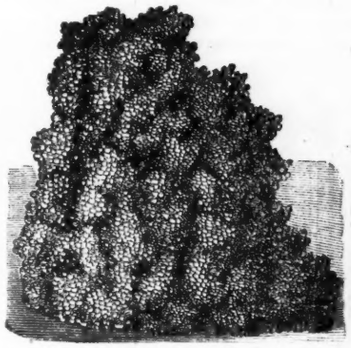


Fig. 1.—FINE GRANULAR BUTTER.

improvement we have nothing now to say, excepting that the method is by no means new; but to avoid interference with a patent, just or unjust, another plan may be pursued. After the butter has been washed, salt may be sprinkled over it, and a few more turns of the churn thoroughly mixes it. A rest of a few hours for the butter to drain may be given, and it is then ready for packing, more salt being added if necessary. Some experience with this churn in the writer's dairy has been very satisfactory, and its simplicity is such that any person, not an expert, can hardly fail to make the best quality of butter in it, after the first attempt. The advantage of using the best dairy appliances is obvious. Price depends upon quality, and quality depends upon the use of the most effective implements. There is no reason why all dairy butter should not be equal to the best product of the creamery, all that is needed, good cows being secured, is to use the same means and methods of manufacture, and the best dairy appliances may be

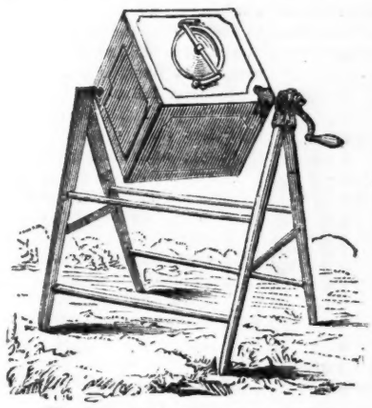


Fig. 2.—THE RECTANGULAR CHURN.

procured at such a reasonble expense, that the extra value of the butter from a small dairy of only five cows will pay for an outfit of a creamery, and a churn of the best kind in a single season.

A Jersey Cow's Record.—It is not rare to find a heavy milker among Jersey cows, yet the average is by no means extraordinary. Possibly a true record of a whole herd of Jerseys as to weight of milk would fall below that of a herd of natives even, and greatly below that of an Ayrshire herd. A notable record of an English Jersey cow, however, is worth recording. The cow is "Luna," owned by Mr. Simpson. In 1876 she gave 8,985 lbs; in 1877, 8,202 lbs.; in 1878, 8,368 lbs.; an average of 8,518 lbs. per year, or equal to a daily average of more than 23 lbs. or 11 quarts. One of the most conspicuous characteristics of a Jersey cow, is her persistence in milking, and although she may not give so great a yield, yet by hanging on during 300, or 330 days, she makes up by perseverance, what others do by more copious, but less continuous milking. If there were only more Jerseys like this one!

Fence-Post Driver.

A fence-post driver on the plan of a pile-driver is shown in figure 1. This is made to fit upon a wagon body, resting on the sill *a*, and being held down by the bolt *b*, which is provided with a thumb screw. The upright post, *c*, one-half only of which is shown, so that the peculiar arrangement can be seen,

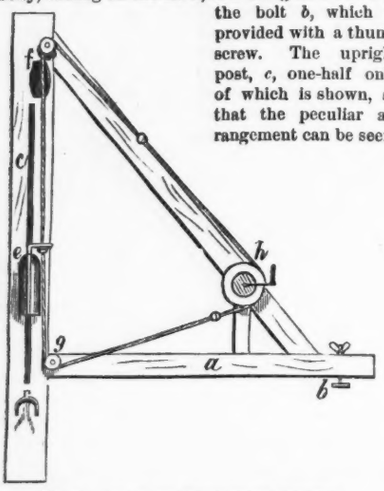


Fig. 1.—PLAN OF FENCE-POST DRIVER.

is 15 feet long, and 12 feet above the sill, 3 feet being below it. On the lower part a pair of guides are provided which clasp the post loosely, and cause it to be driven in the right direction. The driver (*e*) is of the usual kind, provided with flanges which run in grooves in the upright posts that serve as guides. The driver is lifted by a forked catch, through which the hoisting rope passes, and a round button fastened on the rope at proper intervals, engages in the catch and so raises the driver. When the driver is lifted to the top of the post, the button strikes a cam (*f*), which is made with a groove through it to admit a rope, and the button, not being able to pass through the groove, is drawn by the edge of the cam out of the forked catch, so as to liberate it and let the driver fall on to the head of the post. The rope is an endless one, passes over rollers (*g*); and having one turn around the winch (*h*). As the winch is turned the rope is drawn under and over the rollers, the button passing over these, and as the driver falls, a button is ready to take it up again. So that the action is continuously forward, and no rope has to be lowered to pick up the driver. This saves much time and an extra hand, one man alone being able to do all the work if necessary.

Fig. 2.

The posts are held by the guides as shown in figure 2. The head of the post is not driven any lower than a few inches above the guide. The driver should be of cast iron, and, to be most efficient, weigh not less than 50 pounds.

Tape Worms in Lambs.—Tape worms frequently infest sheep and lambs, but injure only the lambs, as these are not robust enough to resist the irritation caused in the bowels. When the lambs are troubled with diarrhœa, and scales, and flat ribbon like fragments are found in the dung, tape worms are present. Then 2 ounces of Pumpkin-seed, mashed, or pounded to a paste; or the same quantity of powdered root of Male Fern; or 2 ounces of Raw Linseed Oil, with half an ounce of Spirits of Turpentine, may be given, and repeated at the end of six days. Two ounces of the oil should be given six hours after the administration of the Pumpkin-seed, or Fern-root. Sometimes a large quantity of segments of the worm may stop the bowels, and cause constipation instead of diarrhœa. In this case, the belly will be found tense, and filled as with wind or gas, and in each case an injection of the oil may be given, followed immediately with another of blood-warm water.

Hints and Helps For Farmers.

A CORN MARKER.—An Indiana farmer sends sketches of a very useful corn marker, which is adapted for uneven, as well as for smooth ground. The implement is shown in figure 1. There are 4 markers connected by cross-bars, and strengthened with braces. The cross-bars are 2 by 3 inches, fitted in notches in the runners, and are hinged so that the runners will adapt themselves to uneven ground, as shown in figure 2. The runner shown in figure 3, is 3 feet long, and 14 inches wide. The hinges are made of rods and eye-bolts, such as are used for harrows. When moving to or from a field, the outer runners may be turned up, as shown in figure 4.

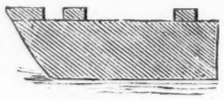


Fig. 3.

TO SLING A BARREL.—It is often desirable to hoist a barrel to a loft or elsewhere. In this case one should know how to sling it. This may be done as shown in the illustration. A rope is passed around the barrel, and a half-twist is made in it. The end is then carried under the bottom, and brought up on the other side, where it is passed around and brought back, and a half hitch taken

Fig. 5.—A SAFETY KNOT.

on the side opposite to the first one. The ends of the rope are then tied, figure 7, thus making a sling by means of which the barrel is easily hoisted.

SAFETY KNOT.—Mr. L. Osius, Washtenaw Co., Mich., sends sketches of a Safety Knot, of which

Fig. 6.—SINGLE BOWLINE KNOT.

we give engravings. Figure 5 shows how the knot is made; *A*, the end of the rope, and *B*, the continuing part. The knot is useful and handy for many purposes, as binding loads of hay, etc.; in fact, for all work when a rope with a safe knot is needed.

ANOTHER KNOT.—Our old friend, Jas. B. Olcott, in sending a holiday greeting, after his usual manner of combining the "useful with the agreeable," sends a note about a knot, illustrating it by the knot itself. Though we illustrated this knot some years ago, we give it again on a larger scale, as it allows us to show an important improvement in the use of wire for whipping the rope. He writes: "I have been thinking of sending you a Single Bowline this long time. It is one of the most useful knots on the farm. I think it indispensable for tethering calves and cattle, because it will never untie when once properly drawn in place, and no matter how tight, or stiff, or wet it gets in use, it may be untied with ease and in a moment. This is the knot we see sailors using when they throw a line to the

Fig. 7.

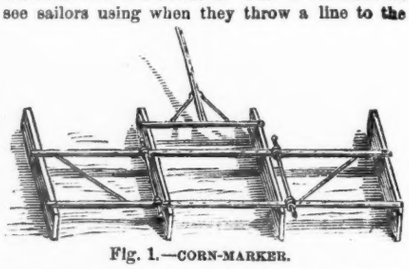


Fig. 1.—CORN-MARKER.

wharf with a hawser, knotted at the end, to make a vessel fast by. It makes no odds how taut she hauls the cable, the big knot that holds her will loosen with a turn of the wrist. The wire-whipping at the ends of the bit of cord speaks for itself. That whipping will outwear any rope. I bend the wire around the end of a rope by successive bites or pinches in an iron vise, coaxing the ends of the wire into place, now and then, with a light hammer." This is much better than using thread.

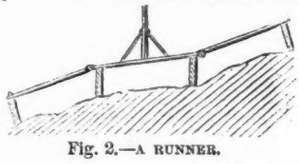


Fig. 2.—A RUNNER.

Fig. 4.

A Barn for Sheep.

Several ask for a plan of a sheep barn, in which cut feed can be used. As a rule, sheep do better on long feed than on that which is cut, or prepared in any way. They masticate their food thoroughly, and in so doing, it is well mixed with saliva, which acts as a solvent of the food, and without which digestion is not perfect. Cut or cooked food is more easily swallowed than long hay, coarse straw, or unground grain, and sheep do not thrive so well upon it. There is some economy in using cut food, and this may in some cases perhaps make up for defects in other ways. But the arrangement of the barn does not depend entirely on the system of feeding; the interior arrangements may be so made, as to be applicable to any method of feeding, and a building of this kind is here described. The ratio of available space in a building, as compared with the length of the wall, depends upon the form; a square building, with 96 feet of wall, will be 24 feet in diameter, and contain 576 square feet in area. A circular building with 96 feet of wall, will be 30½ feet in diameter, and have an area of 732 square feet; an octagonal building with 96

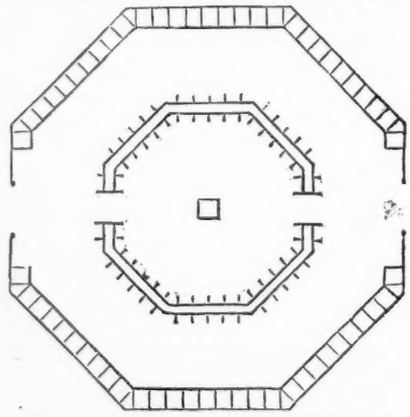


Fig. 1.—PLAN OF OCTAGONAL SHEEP BARN.

feet of wall, will have a diameter of 29 feet, and an area of 696 feet, and a building of this shape, will be built much more conveniently and cheaply, than a round building. For sheep, the octagonal form is especially well adapted, because the largest space is needed, and no fastenings or stalls are required. The inner arrangement for feeding, too, may be

made with the greatest convenience in a barn of this kind. At figure 1 is given a plan of an octagon sheep barn, supposed to be 36 feet in diameter, and intended for a flock of 150, to 200 sheep. A range of feed racks, made as shown at figure 2, runs

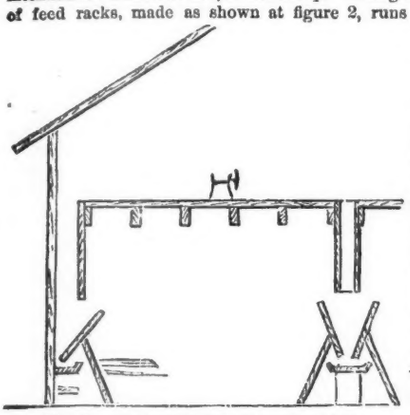


Fig. 2.—ARRANGEMENT OF FEED RACKS.

around the barn, and another 9 feet from it; the latter is double, and is fed from both sides. Feed spouts are dropped from the floor above at convenient intervals, to carry the cut chaff into the feeding troughs. The most economical power for cutting the feed, would be a wind-mill, placed over the center of the barn, and a well might be dug in the center of the building, from which water could be forced into troughs in a yard made around it. The feed trough is made as shown at figure 3, consisting of a box for the feed with a sloping board in

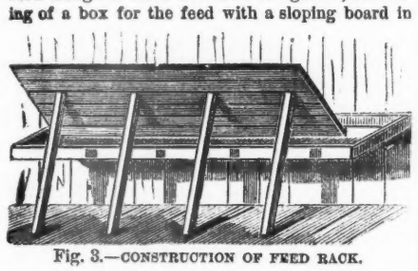


Fig. 3.—CONSTRUCTION OF FEED RACK.

front, coming down to within 4 inches of the bottom, to prevent the sheep from wasting the fodder. Sloping stakes should be fixed about 2 or 3 feet apart in front of the troughs, to prevent the sheep from crowding each other away from their feed. A push rake, (fig. 4), would be found useful for putting the chaff into the spouts. It would not be advisable to wet the feed for the sheep, the labor would not be repaid by any advantage that might be gained. Any grain which may be given to the sheep, might be fed in the troughs once each day

The Sewage Waste of the Family.

We are making some progress, both on the farm and in the village, in utilizing the contents of the sink-drain, and the water-closet, or the earth-closet. But still there is great room for improvement. We consume in our families abundance of animal food, furnishing all the materials out of which plants are made. These fertilizing matters are nearly all wasted, unless there is some contrivance to incorporate them with the soil. If properly saved, the wastes of the family would fertilize the half-acre garden adjoining the dwelling, and make it produce

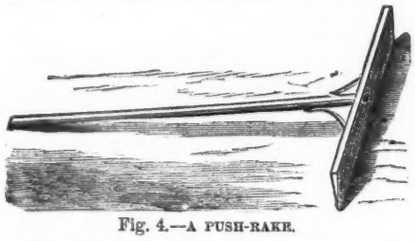


Fig. 4.—A PUSH-RAKE.

maximum crops of fruits and vegetables for the supply of the table. We have tried the two most common methods, that of composting fecal matters, and that of turning them into a cistern for the manufacture of liquid manure. While both are good, and each has its advantage, we prefer the application of these wastes in the form of liquid manure. There is not much choice in either case as to the labor to be expended in conveying fertilizers to the soil. The use of the liquid manure involves a little more expense in the fixtures. For this purpose a cistern is needed of sufficient capacity to hold all the water used in the family for six or eight weeks. The privy vault enlarged and cemented will answer a good purpose. A large earthern or iron pipe four or more inches in diameter, should conduct the sink and laundry water into this cistern. This liquid manure can be used to advantage at all seasons of the year. For the seven months or more it is available for direct application to growing vegetables and fruits in the garden, and for the winter season it can be pumped on to the compost heap where all the vegetable wastes of the garden, and leaves, and muck, are fermenting for next season's use. This liquid not only furnishes plant food, but supplements the rain-fall which is oftentimes quite deficient for maximum crops. So great is the satisfaction of seeing luxuriant vegetation in the garden, and of eating well-grown fruit and vegetables, that we should use liquid manure even if it was more expensive. CONNECTICUT.

Stable Windows.

Many horses are made partly or completely blind by want of windows in the stable, or by windows improperly placed, or not correctly made. If the light comes from one side only, the eye furthest from the light receives less of the sun's rays; if it comes from behind, it is almost as injurious to the sight; if there is no light, the sudden transition from darkness to bright sunshine, more especially in the winter when snow is on the ground, is painful and injurious. A direct face-light is preferable, but a diffused light is better than any other. It is rarely possible to have windows on every side of a stable, and therefore one must choose the best. This is the side in front of the stalls, so that the horse faces it, and the light should come from above. A window made to slide (figure 1), is perhaps the best for a stable, as it is cheap, simple, and may be opened a short or longer space for ventilation. A shade to deflect the light may be fitted below the window, for use in bright weather, as shown at figure 2. This shade is hinged below the window, and may be made to rest on brackets, and form a shelf if desired, or may fall down against the wall. It may be raised by a cord or a short brace from the wall. It should be painted white, so as to reflect and diffuse the light as much as possible. An excellent kind of window is a swinging sash (fig. 3), which, being made to swing out at the top, and in at the bottom, provides at the same time a good means of ventilation. The air will escape at the top, and pass in at the bottom as shown by the arrows. Stable windows, upon which direct sun-light falls, should be shaded by spatter-work, done by spraying lime-wash on the glass, from a paint brush over a round stick. This covers the glass, and while it is translucent, it is not transparent, and softens and diffuses the light.

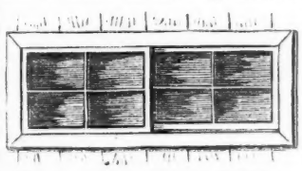


Fig. 1.—SLIDING STABLE WINDOW.

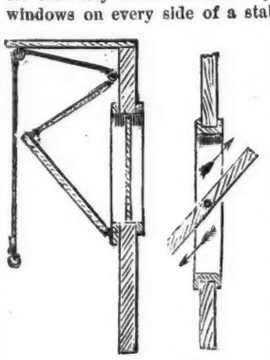
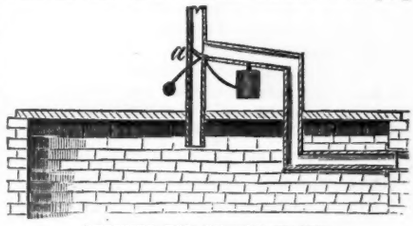


Fig. 2.

Fig. 3.

Pure Cistern Water.

There is frequently much difficulty arising from impure cistern water. Constant complaints are made of it, and inquiries often come to us to know how to purify the water or cleanse the cistern. The difficulty arises from the admission of impurities into the cistern, not that there is anything wrong with the cisterns or with the method of keeping



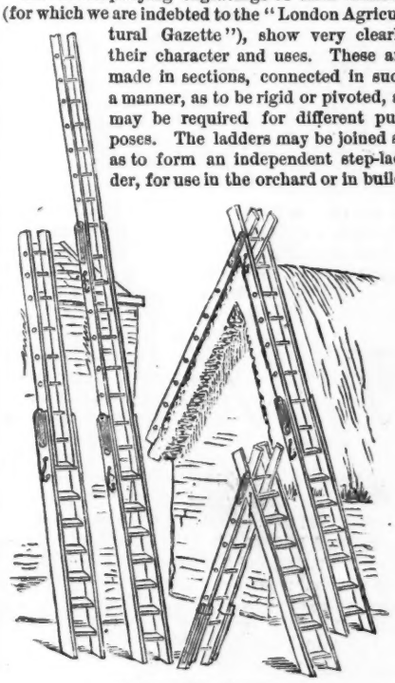
PURIFIER FOR CISTERN WATER.

the water. The impurities are carried in with the first water of a shower that falls, washing the roof of all the various accummulations that gather upon it and in the gutters during the dry weather between the rains. Numerous insects and leaves, a large quantity of dust and various organic matters, such as the droppings of birds, pollen of trees, spores of fungi, etc., are thus carried into the cistern, where they decompose, ferment, and foul the water. This is not nearly so easy to cure as to avoid. It may be prevented by some arrangement by which the first water is turned from the cistern into the overflow, with the gathered impurities.

Such an arrangement is shown in the accompanying illustration. The leader from the roof is connected with a pipe into the outlet, as shown, and a valve is made to shut off the water from the cistern (at *a*). The valve is connected with a lever, weighted at one end to keep it closed, and at the other end is a receptacle for water which runs in a small stream from the offset of the leader pipe. When the rain falls, the water flows off into the outlet, a small portion falling into the receptacle. When this is full it overbalances the weight, and drops, when the valve is moved, so as to close the waste-pipe and turn the water into the cistern.

Farm Ladders.

The accompanying engravings of farm ladders, (for which we are indebted to the "London Agricultural Gazette"), show very clearly their character and uses. These are made in sections, connected in such a manner, as to be rigid or pivoted, as may be required for different purposes. The ladders may be joined so as to form an independent step-ladder, for use in the orchard or in build-



HANDY FARM LADDERS.

ings, or as a long ladder, that may be turned over the peak of a roof for thatching or shingling. By using a third section placed upon a stack, it may be used for building up, or for finishing off the top.

Saws and How to Use Them.

The idea of a saw was probably first suggested to mankind by a jagged edged knife. Some insects are provided with very perfect saws, such as, for instance, the well known seventeen-year locusts, the saw flies, and the wood wasps. Insects were, in fact, the first sawyers, and sawed for their existence ages before a human being thought of a saw. A Grecian story relates that an uncle, Dædalus, and his nephew, Talus, invented the saw almost simultaneously by first discovering that the jaw bone of a snake could be used for cutting wood, and improved upon the idea by notching an iron plate. As in modern times, each one of these

Fig. 1.—A THEBAN SAW.

inventors claimed priority, and there being no patent office to appeal to, the uncle decided the dispute in the old fashion way by killing his nephew, which was a summary and effective manner of settling what a patent lawyer would now call an "interference." Ovid, who is known for his

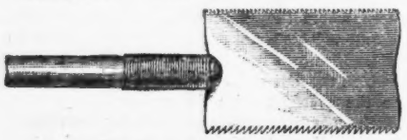


Fig. 2.—A JAPANESE SAW.

doubtful way of giving facts, states that one Perdix, another nephew of Dædalus, made the discovery by using the back-bone of a fish, and was changed to a Partridge by some jealous rival; it is not stated whether his rival plucked him clean, as is done

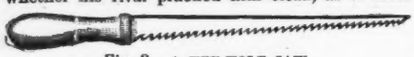


Fig. 3.—A KEY-HOLE SAW.

now sometimes. Then, as now, we see that the inventive faculty seemed to run in families. Saws were made in what is known as the stone age, when

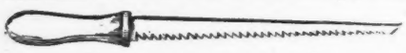


Fig. 4.—KEY-HOLE SAW NO. 2.

only stone tools were in use, by cementing sharp flakes of flint into wooden handles. Saws of a very hard and glassy volcanic stone, known as Obsidian, have been found in New Jersey under several feet of gravel. Saws of the bronze age have been found in Germany. After bronze, iron came into use, and saws (very much like ours of the present day) were employed by the Egyptians. A saw found in the ruins of Thebes, and now in the British Museum, is represented at figure 1, and some old writers of nearly 2,000 years ago are supposed to have known of circular saws. The saw in figure 1 is fastened into the handle by means of a tang, as our knife blades are. Saws are frequently mentioned in Scripture, and stone, even, was cut with saws for Solomon's temple. The fact is, that every form of modern saw which is supposed to be of the very latest invention, has been known for many ages; circular saws were in use in 1777, and even the supposed to be recent band saw was patented in England in 1808. Besides, some very old saws are much better, and made on more correct principles than our modern ones. For instance, who has not been annoyed when using a key-hole saw to find the blade catch and bend nearly double, and sometimes snap off as it is pushed through the wood. But the Japanese and Chinese, and other Asiatics, have used saws of this kind for centuries that are free from this objection. At figure 2 is shown a Japanese saw that was used by a Japanese

Fig. 5.

Fig. 6.

mechanic at the Centennial Exhibition. The teeth are seen to be inclined in a direction contrary to our usual method, and a key-hole saw thus made (fig. 3) could not possibly bend or break while in use, as that shown at figure 4 would certainly do in the hands of one that was not an expert in the use of saws. With this exception, our saws are now more effective than saws ever were, because the principle upon which the teeth work is well understood. The teeth are used first to cut, then to open an easy channel in which to work, and lastly, to remove the chips or saw-dust. The form of the teeth and the "set," or bend given to them, enable them to perform these operations properly. The best form, of course, has been discovered by gradual experience. If a novice attempts to cut a board across the grain with a rip-saw, he will find out that the shape of the teeth has much to do with the work, and that for cross-cutting and cutting along the board in the direction of the fibres, differently shaped teeth are required. A cross-cut saw cuts across the fibres of the wood, and sharp-edged teeth, filed to sharp points, so as to tear the fibres apart, are required. These teeth are triangular, and are most frequently cut at an angle of 60 degrees (fig. 5), and sometimes at an angle of 50 degrees (fig. 6). For greater ease in sharpening, the form of the tooth has been changed in mill saws, as shown at figure 7, and this, by degrees, was improved to the "briar-tooth," figure 8, which is well adapted for the scraping or paring action used in rip-sawing timber. In ripping, a sharp chisel-like cut is made along the fibres, and the piece pared off is wedged out of its place by the teeth, the fibres having little adherence together as they lay side by side. This may be readily seen by the ease with which a board may be split lengthwise. This action is facilitated by the set of the teeth (fig. 9), each alternate tooth being bent outwards, so that the cut is wider than the blade of the saw. Formerly the teeth were bent over in sets of several at one side (fig. 9) alternately, but now each alternate tooth is set. Some sawyers upset or swage the teeth (fig. 10), which has the same effect as setting, but is better, because each tooth has two cutting corners. The teeth of a

Fig. 7.

Fig. 8.

Fig. 9.—TEETH SETTING.

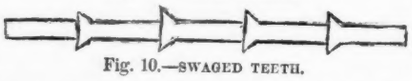


Fig. 10.—SWAGED TEETH.

cross-cut saw divide the fibres across, and reduce them to dust, the edges being sharp, to produce a clean cut (fig. 11). This is the **M** form of tooth,

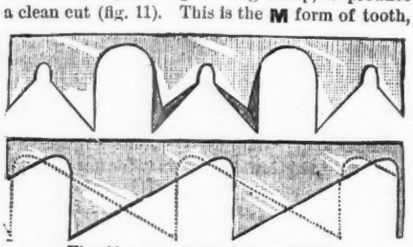


Fig. 11.—THE **M** FORM OF TEETH.

which was first described in 1846 in Germany, and it is, in fact, a doubled ordinary saw tooth, cutting both ways, and is therefore very rapid in its action. The teeth are usually set by bending the whole doubled tooth (fig. 12), but sometimes each half-tooth is bent alternately. This form of saw cuts in a remarkably easy manner. Perhaps the most useful innovation in sawing, is the use of the band saw, in which no back stroke is made, but a continuous down-stroke of a thin saw-plate, which runs over two large pulleys. This is an improvement on the circular saw, which has also a continuous motion, as the band is always tight and rigid, and does not spring as a circular saw sometimes will (into a dish form,) by the heating and expansion of the outer portion of the disc.

As saws are wasted by filing, the space between the teeth is removed by "gumming," which is cutting away the metal, or punching it out. To ren-

Fig. 12.—SHOWING THE SETTING.

der this operation easier, some saws are made with holes in the lines of the "gullets" (fig. 13); rounded gullets are stronger than acute angled ones, and do not crack as easily as the latter do (fig. 14), and the holed saws are convenient, not only on this account, but because a crack that may start, will not go beyond the first hole. For the purpose of clearing the saw-dust, a few teeth are sometimes left without set, and filed shorter than the others, but this is not necessary if ample room is left in the gullet to carry out the sawdust. American saws were formerly considered inferior to the English, but by care and skill in the manufacture, they are now superior to the English, and are largely exported to England. An American mechanic now insists upon having an American saw.

Shell Marl, Oyster Lime, and Swamp Muck.

The recent numbers of the Weekly Bulletin of the Connecticut Agricultural Experiment Station, under the able directorship of Professor S. W.

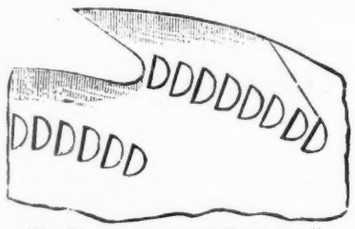


Fig. 13.—HOLES IN THE "GULLETS."

Johnson, have contained information of value to the general farmer. In the number for February 7th is an analysis of a Shell Marl which is shown to consist of 40 per cent of Carbonate of Lime and about 2 per cent of Carbonate of Magnesia, the remaining being mostly sand and moisture.

"There can be no doubt that its employment, in liberal quantities, viz: one or more tons per acre, especially upon grass lands, would often be attended with decided and long-continued benefit, but, in most cases, its action upon grain crops would not appear at once in so decided a manner as is very commonly the case with good superphosphates or guanos.

"The fertilizing effects of this Shell Marl, as well as its commercial value, may be safely measured by the percentage of lime which it contains."

It is proposed to put this marl on the market as a fertilizer at $15 per ton, a price that is far more than the material is worth.

The analyses of Oyster-Shell Lime, of which three are given in the same Bulletin, show that the principal constituents are Carbonate of Lime and Hydrate of Lime, with small quantities of Potash, Soda, Magnesia, and Phosphoric Acid.

"When applied to land, oyster-shell lime may act as *fertilizer* strictly speaking, or as an *amendment*. Commonly, both kinds of action are exerted, and the distinction between fertilizer and amendment is not generally recognized in practice, although very important in considering the effects of this substance. Lime is used as an amendment on heavy clay soils, 2 to 3 or more tons being sometimes applied per acre. On loams or light lands

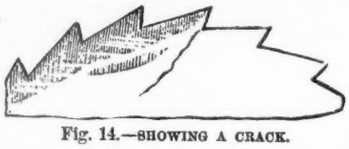


Fig. 14.—SHOWING A CRACK.

1,000 pounds, or 20 bushels of Oyster-Shell Lime, applied once in two or three years, is a usual application, equivalent to the addition of 300 to

500 pounds to the acre, annually. It is evident that the small quantities of potash, magnesia, and phosphoric acid contained in such doses of oyster-shell lime can have no sensible effect upon crops.

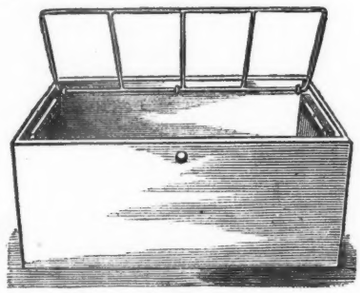


Fig. 1.—A HINGED GUARD.

It is the lime alone, therefore, to which any benefit must be ascribed. A consideration of the modes of action of hydrate of lime, when applied as a fertilizer, will make evident that it is one of the most valuable aids to the farmer and deserves more attention from land owners than it has received.

"Our cultivated crops contain on the average as much lime as potash. The necessity for the application of potash salts is fully recognized, but probably the lack of lime is as common a cause of unfruitfulness; for while potash seldom wastes from the soil to any serious extent, and is found in

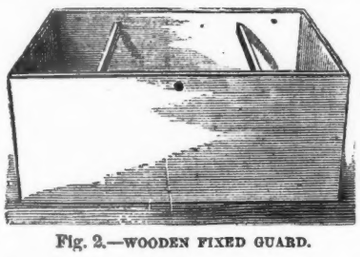


Fig. 2.—WOODEN FIXED GUARD.

spring, well, and river waters, in extremely small quantities, lime freely dissolves in water and rapidly wastes from the soil, so that other things being equal, there is more need for its restoration."

The three samples of Peat or Swamp Muck, the analyses of which are given in a later Bulletin, contain 2 to 3 per cent of Nitrogen, which, when the muck is acted upon by an alkali, like lime, becomes available plant food.

"There can be no doubt that the application of this swamp muck, especially to poor, light soils, would be very serviceable. Evidently, however, the large proportion of water which the fresh muck contains makes it a nice point to decide how much can be spent upon its handling without consuming the profit of its application. The proper mode of using swamp muck is to throw it out where it will drain and dry for some months, during frosty weather, and to employ the weathered muck as an absorbent in the stables or barn yard, or to com-

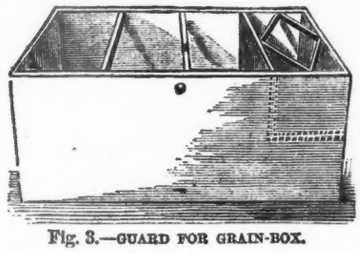


Fig. 3.—GUARD FOR GRAIN-BOX.

post it with lime, fish, or any other animal matters yielding ammonia by their decomposition."

Guards for Feed Troughs.

To prevent the feed or hay from being thrown out of the mangers or feed-boxes, a practice which some horses indulge in very freely; it is customary to use guards, which may be either hinged so as to be raised up as shown at figure 1, or fixed across the manger as at figure 2. The guard, like figure 1, may be made of strong wire, or light bar-iron, riveted together, or it may be merely a wooden frame. The guards shown in figure 2 are simply wooden cross-bars, so fixed by means of nails, that the horse or cow cannot throw out the feed with its nose. For feed-boxes the guard may be made by nailing pieces across the corners, as shown at figure 3, if the box is not large enough to allow them to be nailed lengthwise. Some such device as shown in the engravings, should be provided, whenever there is a disposition on the part of the animal to waste its feed. A few minutes in making a guard of some kind, will save many times its cost in the course of a few weeks.

Poultry Farming.

There is no other branch of stock keeping that seems to be so popular or promise so favorably as poultry raising. The general idea is that the business consists of throwing out corn to a flock of hens with one hand and gathering eggs with the other. But while this may be true in some cases, it is very different in others. It is very interesting for a novice to watch an expert performing some intricate operation with the greatest ease and coolness and with perfect success, and he may think it is a very simple matter. It is the same in regard to poultry keeping; the expert poultry fancier meets with no difficulty and all goes on smoothly, but the novice is in trouble from the first; the eggs are few, the chicks die, vermin and disease destroy the flock, and the attempt ends in disaster. Probably the reason is, that too much has been attempted and failure has resulted as much from this as from want of attention. One may very easily keep 10 or 12 fowls with profit, who could not easily double or treble this number successfully, because with a large number, all the difficulties which arise, such as want of cleanliness, the pres-

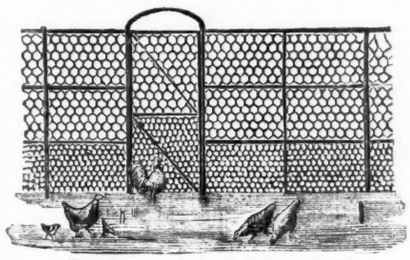


Fig. 2.—PLAN OF POULTRY FENCE.

ence of vermin, impure air and risk of infection increase in a much larger ratio than does the number in the flock. But if one has succeeded with a small flock there is no reason why he should not be able to do so with several flocks, if each is kept in just the same manner as the original one. Afterwards the flocks may be enlarged, but as this is the very point on which most of the younger poultry fanciers fail, the greatest caution should be observed in adding to the number of fowls kept in each coop or house and yard. An inquiry is made by one who is desirous of keeping fowls upon a farm of thirty acres which has a stream passing through the middle of it, as shown in the plan in fig. 1, which is given as a good method of dividing it and arranging the yards and houses. From considerable experience with a similar plot of ground, we would suggest that the thirty acres be laid out in lots of two acres each as shown. The dwelling and orchard lots in the center would contain two acres, and each of the acre lots on either side of the stream would have a yard or "run" fenced off and kept in grass for grazing. The houses would be ranged, each in its yard, on both sides of the stream, as shown, and a plentiful supply of water would be always at hand. A yard is behind each house; the yards behind the dwelling may be used for brood coops in which the young chicks

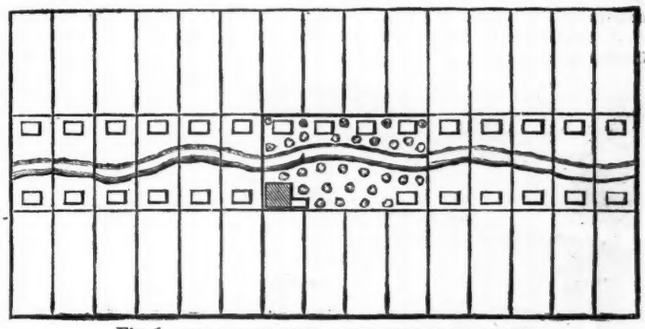


Fig. 1.—PLAN OF POULTRY FARM OF THIRTY ACRES.

would be near at hand. The fences between the yards may be of pickets or wire; the latter would be preferable if it could be afforded. A very complete arrangement of wire fence is shown in figure 2, and one for a small coop and covered yard in figure 3; a range of houses of very convenient shape and size, which may be left open or enclosed with yards, is shown in figure 4. It would be proper to keep each lot securely fenced, so that the flocks

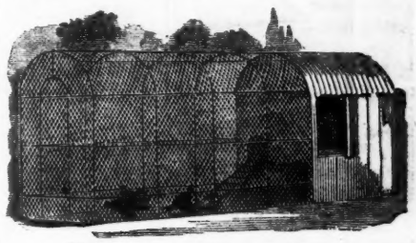


Fig. 3.—COOP AND COVERED YARD.

could not mix, and not to keep more than fifty or sixty fowls in each plot. It would be better to begin with twenty-five at first, which would be enough until it was found safe by experience to gradually increase the number in the flocks.

Milk as Poultry Food.—We have been trying milk as poultry food during the winter and can confidently recommend it to villagers and farmers who keep one or more cows for family use. Where butter is made and skim milk is plenty, it is a very valuable addition to the fare of the poultry yard. One main difference between winter and spring laying is owing to the absence of animal food in winter. The milk supplies this, and is devoured with eagerness. The skim and buttermilk may be poured into the feeding trough, and kept constantly by the fowls, or it may be mixed with scalded meal of various grains. Indian meal is a good ration once a day, but it should be varied with oat or rye meal, and with whole grain of wheat, buckwheat, or barley. In a warm room with a good southern exposure, and plenty of light, there is no difficulty in getting plenty of eggs from early pullets, and this is the time when eggs are of great market value. Later in the season, when the broods

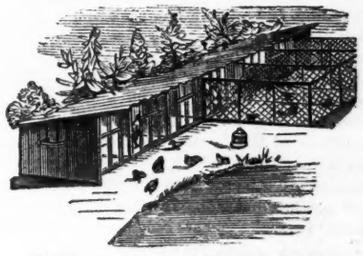
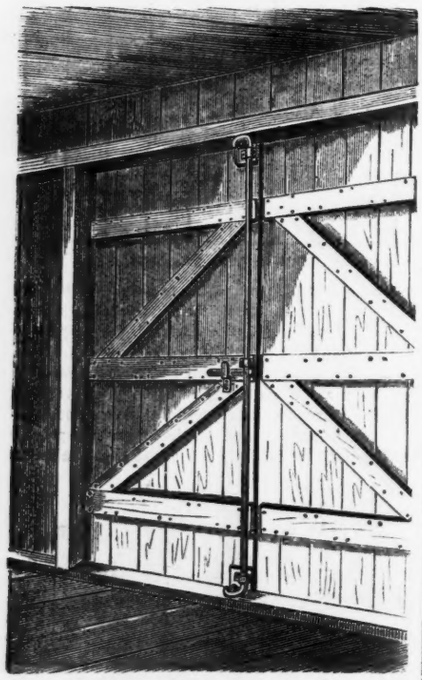


Fig. 4.—RANGE OF POULTRY HOUSES.

come off, milk, which will then be more abundant, will be an excellent feed for chickens, turkeys, and all kinds of young poultry, and will give quite as good returns as when fed to pigs.

Another Inside Door Fastening.

Last month we published three forms of inside fastenings for double barn doors, all of which were constructed of wood. H. Minton, Morris Co., N. J., hands us a sketch of another fastener, that is constructed of iron, and is highly recommended



AN IRON INSIDE DOOR FASTENER.

by Mr. M., and others, who have it in use in his neighborhood. The long iron rod running the whole length of the door, is ½-inch in diameter, and fastened to the inside of the door by three iron strips, as shown in the engraving. The ends of the rod are so bent that they act as hooks, passing around ½-inch iron pins, driven one at the bottom, and the other at the top of the door frame. The rod is turned by a small lever near the center, which acts on a pivot, and is put in a rest when the door is fastened. Any blacksmith can make the rod for this very convenient barn-door fastening.

What Shall We Raise?

The question above given interests every farmer, but especially those of us who live in the older portions of the country, where "farming don't pay," is so often asserted, and so often illustrated by those who assert it. The State Board of Agriculture of Massachusetts, held its winter meeting in December last, at Greenfield, in Franklin Co., in the N. W. part of the State. Those of us who attended from other States, found much to interest and instruct. The excellent dairy show held at that time, has been described in "Among the Farmers." A most interesting part of the proceedings, was a paper on the Agriculture of Franklin Co., founded upon the U. S. Census of 1840, and the State Census of 1875, and pointed out the changes that had taken place in the farm production, during 35 years. I wish that this paper could be read and considered, not only by every New England farmer, but by every farmer in all of the older States, where the farming of 50 years ago no longer "pays." The experience of the farmers in Franklin Co. shows that if "the times" change, we must change with them, and if one crop does not pay, we must then grow another that will. It appears from the paper referred to, that there are only five crops cultivated in Franklin Co., that show any substantial increase in the interval of 35 years. These are poultry, which rose from $9,678, to $31,155; hay increased from 43,853, to 61,056 tons; tobacco, from 600 lbs to 1,997,091 lbs.; dairy products, from $165,765, to $424,042. Broom corn is a new crop in the county, and only amounted to 13,579 pounds. Besides these crops which have increased, neat cattle, horses, and corn, show but a slight falling off, and may be considered fairly paying crops. There is a great falling off in the number of sheep, but the large increase in their value per head, and in the value of lambs sold for market, would probably make sheep raising a paying industry. In nearly all other farm animals and crops, there is a large falling off in production, showing that farmers do not consider it profitable to raise them. Swine, wheat, and rye, have fallen off nearly 200 per cent, oats more than 300, and potatoes, 100 per cent. The increase in poultry is about 300 per cent, dairy products about 400, orchard products 500, and tobacco still larger. Franklin County is in the heart of the New England dairy region, and probably shows as fairly as any county, the drift of eastern agriculture. The fair inference is that farmers are abandoning these crops which show so large a decrease, because they are unprofitable. Agriculture in the older States, is in a transition state, and we are slowly feeling our way to a better husbandry. The progress is very slow, but we are confident it is very sure. So much light is breaking out from our agricultural journals, our State and County Fairs, and our Farmer's Conventions, that we can not always grow crops that run us in debt, because our fathers grew them. We must inevitably get out of the ruts. Nothing could show more clearly than these statistics, the folly of raising crops that do not pay. Pork raising for the general market, does not pay, and it has fallen off 200 per cent in 35 years. Why, then, should we undertake to raise any more pork, than will supply the family? The raising of poultry does pay, for it has increased 300 per cent. Why should we not invest our capital and labor, in that which experience shows, pays well. A farmer with a good range, can raise a ton of turkeys, at much less cost than he can raise a ton of pork. The ton of pork would be worth in the village market this year, about six cents a pound, or $120.00 a ton. The turkeys eighteen cents, or $360.00. Why not raise turkeys? And so, of the other things that are proved to be profitable. Let us get out of the ruts, and raise those crops that are promptly called for. Farmers should keep a keen eye on the markets, and see which way the popular taste is tending, and plant, sow, breed, and in every way plan to meet the demands of the times.

Racks for Feeding in Yards.

The season for yarding feeding is coming on, and some considerations about racks will be useful. The form of rack is important, because on that depends, in a great measure, the economy in the use of fodder. Frequently a large portion of the fodder is pulled out under foot and wasted; it is, therefore, necessary to provide against this in making the rack. Cows are quarrelsome and selfish, and it is instructive to see one filled and satisfied, but still

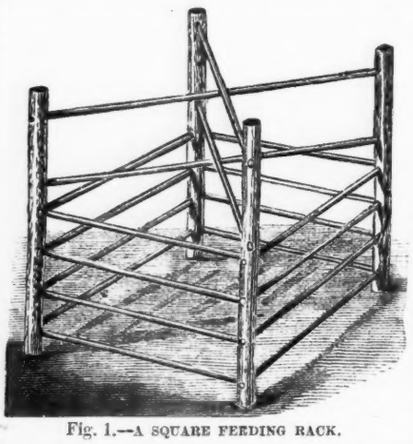


Fig. 1.—A SQUARE FEEDING RACK.

remaining in front of the rack so as to prevent her hungry sisters from getting a mouthful. This has to be provided against, so that each may get a share. A rack especially designed for this latter case is shown in figure 1. This is made of four stout chestnut or oak posts, 5 feet high. Lighter cross-bars are fitted in 2-inch holes, as shown in the engraving, to a hight of 30 inches, and close enough together as to prevent the fodder from being pushed out. Above these two, other cross-bars are fitted for the purpose of preventing the cows from pushing each other from the feed. A long rack, in which green clover, oats, or hay, can be fed is shown in figure 2. This is made of posts at proper intervals, and strips of boards or planks, 6 inches wide, spiked or bolted to the posts. A double rack is made in the middle, in which the fodder is placed. A rack for feeding meal, grain,

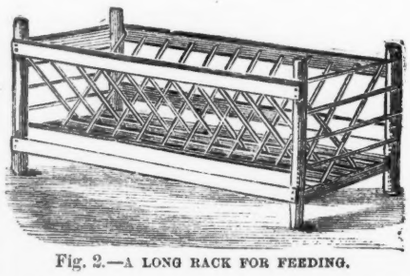


Fig. 2.—A LONG RACK FOR FEEDING.

or chaff, to cows or sheep, is shown in figure 3. This has a double slide, or hopper, the bottom of which is 3 inches or so above the floor of the rack, thus leaving a space for the feed to fall upon the level bottom from which the animals can readily eat it.

An Agricultural Creed.—It may be well to put down in black and white just what one thinks of any particular thing or class of things, and it may lead to good results if we subscribe to some

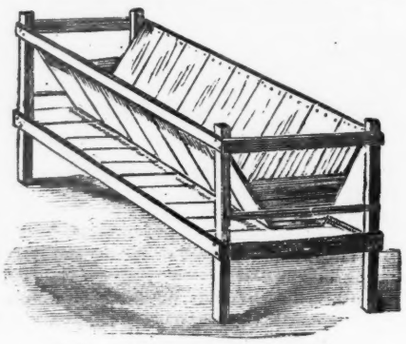


Fig. 3.—RACK FOR FEEDING MEAL.

formulated statement of the importance, and the varied demands of the best farming. At any rate this seems to have been the view of some of the agriculturists of Canada, who met in a convention and adopted for themselves the following *Agricultural Creed:* "We believe in small farms and thorough cultivation; we believe that the soil lives to eat as well as its owner, and ought, therefore to be well manured; we believe in going to the bottom of things, and therefore deep plowing, and enough of it—all the better if it is a subsoil plow; we believe in large crops which leave the land better than they found it, making both the farm and the farmer rich at once; we believe that every farm should own a good farmer; we believe that the fertilizer of any soil is a spirit of industry, enterprise and intelligence; without these lime, gypsum and guano would be of little use; we believe in good fences, good farm-houses, good orchards and good children enough to gather the fruit; we believe in a clean kitchen, a neat wife in it, a clean cupboard, a clean dairy and a clear conscience; we believe that asking a man's advice is not stooping, but of much benefit; we believe that to keep a place for every thing and every thing in its place, saves many a step, and is pretty sure to lead to good tools and to keeping them in good order; we believe that kindness to stock, like good shelter, is saving of fodder; we believe that it is a good thing to keep an eye on experiments, and note all, good and bad; that it is a good rule to sell grain when it is ready; we believe in producing the best butter and cheese, and marketing it when it is ready?"

The New Varieties of Coleus.

Plants with bright-colored or variegated foliage are of special value in this country, where our hot summers prevent us from doing much in the way of producing bedding effects with flowers. The intense heat that causes such a rapid development and short duration of flowers is, as a general thing, favorable to the growth and coloring of the leaves of the so-called "foliage plants." Among these plants the Coleus stands at the head; the old Velvet Coleus, *C. Verschaffeltii*, introduced some 20 years ago, is as popular and valuable as ever; a bed of its rich velvety dark maroon foliage, in contrast with the green of the lawn, presents a combination and contrast of colors of which the eye never tires, and which is pleasing in a place so small that it is the only decoration, or in extended grounds where it comes in as a part of an elaborate design. It was some years after the introduction of this excellent old plant that any others were offered, but new varieties came after a time, and of late each year has brought its "set" of new Coleuses, some of great merit. While our climate brings out the beauty of some kinds, it is very severe on others. Many of the so-called "Golden" varieties, in which the leaves present rich maroon or crimson, and golden yellow in beautifully contrasted markings, so long as the plants are partially shaded, when exposed to the full sun lose their markings and become all of the darker color. There are a few exceptions to this, as in the "Shah"; its leaves are curiously divided or halved by the two colors, and retain their beauty admirably. But however beautiful and brilliant the older Coleuses, they are completely thrown into the shade by the new varieties offered this spring. Both Henry A. Dreer, of Phila., and Peter Henderson, of N. Y., have been raising seedlings, the one with some seed from Australia, and the other with seeds from *Coleus multicolor* and *Chameleon*, and the results obtained by both are among the marvels of horticulture. As we examined the specimens sent by Mr. Dreer last fall, and by Mr. Henderson this spring, we felt that any painting or colored engraving that should exactly reproduce them would be looked upon as a freak in color by the artist rather than a true portrait of real leaves. In these new kinds the range of colors is surprising. Among yellows there are from rich cream through lemon to deep golden and orange; in reds from pale rose through every shade of carmine to scarlet on the one hand and crimson on the other, and deepening into maroon and chocolate; besides there are various lively tints of green. These colors are in veins, dots, blotches, and variously washed and blended in the most pleasing manner. All that our group of leaves from Mr. Henderson's varieties can do is to give the effect in light and shade, and show the general character of the markings; the picture must be filled out by imagination, and no effort of this can exceed the reality. Each of the florists named, after selecting from some thousands of seedlings, has some 50 varieties too good to discard. Like Mr. Ricketts with his wonderful grapes, their success has been "too unanimous," and they are overweighted with treasures. For descriptions of those that are offered, reference must be made to the catalogues. What will be their final place time only will show; if any considerable number retain half their present beauty when cultivated in the open ground, they will become among our most popular plants; if they fail to stand exposure, their usefulness will be limited to culture under glass. It is not easy to imagine a more beautiful sight than a greenhouse or conservatory would present if filled with well grown specimens of these new and wonderful Coleuses.

A COLLECTION OF NEW COLEUS LEAVES.

A New Cape Bulb.

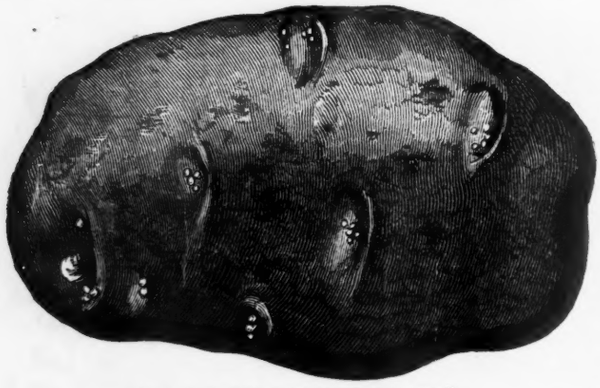
Last summer we saw in the grounds of Messrs. Woolson & Co. a plant quite strange to us; it might be described by comparing it to a miniature Gladiolus. We were so much pleased with its appearance that we brought away specimens for the sketches from which the accompanying engraving was made. The plant was introduced into Scotland long ago, some bulbs having been sent from the Cape of Good Hope to Mr. G. H. Potts, near Edinburgh, Scotland; here they were cultivated for many years, and it is only recently that it has received the attention of English cultivators. It turns out to be a *Montbrettia*, and in honor of the gentlemen who introduced it, is called *M. Pottsii*. It grows about two feet high, has plaited leaves, and a slender, wiry flower stalk which is often branched. The flowers are of a very dark, rich scarlet, quite close upon the stem, but not crowded, and turning to one side; they are an inch or more long, and of the shape shown in the engraving. One of its valuable qualities is the long time the flowers remain in perfection. It is useful for cut-flowers, as its spikes have not the stiffness and formality of some related plants, and its lasting qualities adapt it to this use. Though one would not expect to find a plant from the Cape hardy in our severe winters, it has proved so in England,

A NEW CAPE BULB (*Montbrettia Pottsii*).

and will be tested in that respect here. In England it is much valued for pot culture. When this *Montbrettia* becomes better known, we have no doubt it will be generally cultivated, as it has all the qualities which should make a plant popular.

The Potato "Mammoth Pearl."

A few years ago, earliness was the quality most sought for in a new potato, and it was regarded as the highest praise to say that a variety was "a week earlier than the Early Rose." Earliness is desirable, but it is only one of the good qualities a potato should possess. Ready steam communication has nearly obliterated our "times and seasons" for vegetables, and so far as putting new potatoes on the market goes, that is done by the southern



THE NEW POTATO "MAMMOTH PEARL."

grower, who will anticipate the northern market farmer weeks before he can dig his potatoes, no matter how early they may be. In fact, new potatoes appear in the New York market, before the New Jersey and Long Island growers have planted theirs. Of late, potato growers have given attention to health, keeping and eating qualities, uniformity of size and productiveness in a variety rather than its earliness. Last spring Mr. J. A. Everitt sent us a sample of his new variety, the "Mammoth Pearl," for trial; they were accompanied by claims for a yield that seemed improbable—yet the raiser was convinced of their truth for he had sent the potatoes to allow us to prove or disprove them. Before the potatoes could be planted, a horse had got loose in the night and helped himself to the "Mammoth Pearl," and there were only a few eyes saved from the wreck. These eyes were planted, and when the few hills were dug, they, as far as they went, bore out the claims for productiveness. But one is not justified in recommending a potato for general culture from his experience in raising a bushel, though that quantity will allow him to judge of the quality. The "Mammoth Pearl" is large, its general shape is shown in the engraving, which is about two-thirds the average size. Being usually flattened, no part of the interior is so far from the surface that it does not cook through equally, and when cooked is very white and mealy and of excellent quality. The skin is smooth and of remarkable whiteness; circular says, "whitest of any variety." The eyes are few and even with the surface. Its keeping qualities are all that can be desired. In the important matter of productiveness the raiser makes the claim that it is the "most productive of all varieties grown in America," and "yielding double or triple any ordinary kind." We might regard this as extravagant were it not supported by testimonials, in some cases from persons well known to us; what they say is supported by our own limited experience, so far as it goes, and we have no doubt that the "Mammoth Pearl" will take a high rank as a cropper. As to season, it is medium early, reaching maturity along in August.

Rhubarb.—Some thirty years ago, the writer procured of Hon. Marshall P. Wilder a few roots of "Myatts' Linnæus" Rhubarb, and though we have since changed residence several times, the descendants of the same stock are still in the garden. Rhubarb comes so early in spring; is so palatable and wholesome, whether stewed for sauce or made into pies, and sells so well in the village market, that no good housekeeper can afford to do without. As to varieties, after trying several later kinds, the "Myatts' Linnæus" has the preference. It is large enough, is of excellent flavor, not too acid, easily cultivated, and prolific. A dozen roots planted three feet apart each way, will supply an ordinary family and leave a surplus to give away or sell. The roots ought to be divided in fall or very early spring once in four or five years. A single eye with a vigorous root will make a large stock in a single season. The stalks may be plucked the second year, only care should be taken that leaves enough remain on the plant to keep it in vigorous growth. For a new plantation of Rhubarb, select rich well drained soil well exposed to the sun. Much of the profit of growing it for market depends upon its earliness. It is a gross feeder, and should have abundant supplies of manure every fall or spring, forked in around the plants. There is no danger of making the ground too rich. It bears forcing well. The season may be anticipated three or four weeks, by putting a common hot-bed frame and sashes over the plants where they stand. Rhubarb comes at a season when the winter apples begin to fail and before the strawberries ripen. It ought to have a place in all our village and farm gardens. It starts with the crocus, and is among the earliest plants to welcome the spring.

The Lettuce Mildew.

For a number of years the market gardeners in some localities have suffered more or less severely from the attacks of a mildew on their early or forced lettuce. This spring the numerous complaints led us to inquire into the trouble, which had reached

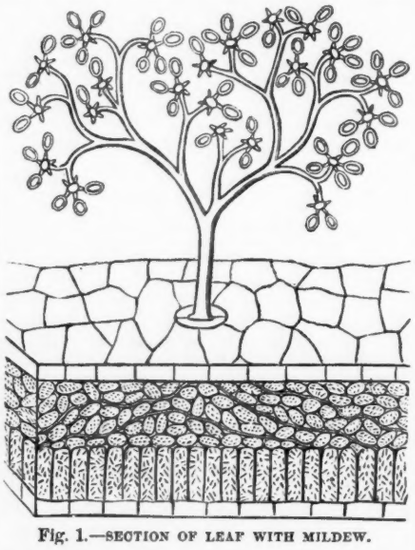


Fig. 1.—SECTION OF LEAF WITH MILDEW.

such magnitude, that one gardener assured us that it was taking away from him, and those engaged in the same business around him, the source of their very living. The following circular was addressed to many of the leading growers of early lettuce, Secretaries of State Horticultural Societies and others from whom information could be gained:

245 BROADWAY, NEW YORK, *Jan. 14th*, 1880.

"*Dear Sir.*—In order to become more thoroughly acquainted with the prevalence of the *Lettuce Disease*, the following questions are proposed. It is desired that they receive the early attention that the importance of the subject demands:

1. Have you been troubled with any disease of your lettuce, and if so to what extent?
2. So far as you can judge, what is the nature of the disease?
3. What part of the plant is first affected, and what are the conditions of the weather, soil, etc., when the disease prevails?
4. Have you tried any remedies; if so, what, and with what results?
5. Are some varieties of lettuce more susceptible than others?

Please add any other information on the subject that may not fall under the above questions, and greatly oblige, etc."

From the responses to these questions we infer that the Lettuce Disease is at present confined to the Atlantic States, and that it is most prevalent in those localities were lettuce has been grown upon the same ground for a considerable length of time. There is no doubt but that it is a fungus, as a microscopic examination of the specimens from Newark and Jersey City both abundantly show; in fact the mildew upon the lettuce is not a new thing, it having been described a number of years ago. It first manifests itself upon the older and outer leaves as a fine frosty coating, soon causing the leaves to turn dark-colored, wilt down, and rot away.

Fig. 2.—TIPS OF BRANCHES.

The Lettuce fungus is a near relative of the grape mildew, belonging, as it does, to the same genus of parasitic pests. In general structure, methods of growth, and propagation, it is therefore much like that of the mildew of the grape, which was fully described in the *American Agriculturist* for September, 1879. It is to be remembered that these mildews are exceedingly small, and in presenting any illustrations of them they can only be those of greatly magnified views. When the actual surface of the lettuce leaf is examined with a hand lens, the white substance resolves itself into a miniature forest of small stems and branches.

In figure 1 a highly magnified view of a cross section of the lettuce leaf is shown, with a single mildew branch, passing out of a breathing pore of the leaf where it divides quite regularly and forms a tree-like top. The tips of the branches are of a peculiar star-like form, and from the radiating points the spores (or seed-like bodies) are formed and when ripe are easily detached. Figure 2 shows a much higher magnified view of two of these ultimate branches with a single separated spore drawn on a still larger scale.

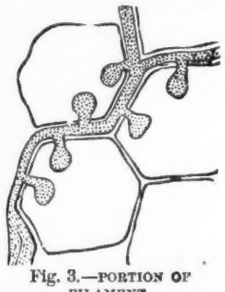


Fig. 3.—PORTION OF FILAMENT.

The portion of the fungus beneath the surface of the lettuce leaf consists of winding threads which, as they pass between the cells of the lettuce tissue, form projections that pass through the cell walls and serve as *suckers* to absorb the substance of the cells. A highly magnified view of a small portion of an embedded thread is shown in figure 3. This is the real nature of the trouble, a multitude—a forest so to speak—of small plants, living upon and drawing away the very life of the lettuce.

In the way of remedies we have, up to the present time, but little to suggest. The fact that the trouble is in nature very similar to the grape mildew, and that the use of Flowers of Sulphur has proved the most effectual in the latter case, it is to be presumed that it also is the remedy for the lettuce mould. There is this difficulty in the use of Sulphur in the case of lettuce; the foliage is the portion both dusted and eaten, and unless the leaves are thoroughly washed—as they ought to

be any way—a sense or suspicion of eating sulphur would be developed that would tend to greatly diminish the consumption of this excellent green food. Lime sprinkled upon the plants has proved of considerable value in some cases as our correspondence indicates. In those localities, or rather on that soil, where the crop has been ruined, it is suggested that the growth of lettuce be abandoned for a time, for there is no doubt but that the soil has become foul, so to speak, and an absence of the lettuce plant is essential to the eradication, by death by *starvation*, of the minute fungus spores.

Have You a Strawberry Bed?

This question is put to every reader who has the land, and especially to every farmer, who, having the land, is very apt to not have strawberries. Without taking space to inquire why the farmer, who of all others should have an abundance, so generally has no strawberries, we put in our plea for his family, and insist that he shall provide them with this excellent fruit—not only a few as a luxury, but an abundance. There is just one time to make a strawberry bed, and that time is NOW! Under any circumstances a strawberry plant must grow a season before it will give a crop; there is no way in which plants may be set this spring and give fruit the same season. If any "nursery agent" offers such—don't buy them. Much that has been said about strawberry culture has conveyed the impression that it is a great deal of trouble; that runners have to be cut off and much care given otherwise, while in fact it is no more trouble to raise strawberries, than it is to grow carrots. But the cost? Is very little—nothing compared with the result in fruit. One can begin as small as he pleases; if he can not afford the outlay for a large bed, let him buy enough for a start and raise his own plants. It makes no difference where the farmer may be, if he gets the *American Agriculturist*, he can have strawberry plants—the mail brings both. A dozen, or a hundred plants come by mail, and when one has even but a dozen plants, his strawberry future is provided for. "It is the first step which costs" is a proverb. In this case "it is the first step which tells." While we have in view especially the family comfort, it may be well to consider that in most localities enough berries can be sold from the first crop to pay for the whole outlay—only don't sell and let the family go without, but have enough for both demands.

"*How many shall I plant?*" will be one of the first questions to decide. An ordinary family should have at least 200 plants, and generally 400 will not be found too many if the fruit is used freely. It is better to provide for an abundance.

What kinds?—If restricted to one kind, we have no hesitation in saying, Charles Downing. If there are successful strawberry growers in the vicinity, find what does best with them and plant the same kind. But we do not advise planting all of one kind. If 400 plants are set there may safely be four kinds. Charles Downing, Monarch of the West, Champion, and Sharpless, would be a good selection, but it may be varied and not go amiss.

How to Plant.—Select a good bit of soil, all the better if it was in potatoes last year, and if practicable within sight of the house, and prepare it just as you would for a good crop of cabbages; this means an abundance of the best manure well worked in. Mark out the rows two feet apart, three if a cultivator is to be used, and set the plants one foot apart in the row, using a trowel to open the ground, and when the plant is put in, crowd the soil down firmly over the roots with both hands. Thereafter run the cultivator, hoe, or rake, often enough to make the soil mellow and keep down the weeds. The plants will by and by throw out runners; turn them into the row and let them take root. For the after treatment of the bed, consult "Notes about Work" at the proper season.

Raising Plants.—If it is preferred to buy a few plants to start with and raise a stock to put out next year, set these two feet apart each way, and let runners form. Ashes are very useful to promote a large growth of runners. Finally, plant strawberries—and be sure to do it this spring.

That Grape Vine.

Two years ago (1878), knowing that there must be few, if any, among our readers, who could not somewhere find a place for a grape vine, we insisted that one vine at least, should be planted, wherever there was a bit of soil, no matter if it were in the smallest of village or city back-yards. In a series of articles headed, "One Grape Vine," we gave minute directions for its planting, and showed how it would grow through the summer, and what should be done with it. That these articles led to the planting of a great many vines, our correspondence shows, and even now we have letters, asking advice as to that "One Grape Vine." The greatest number of letters at the present season, are with regard to pruning and training, and they especially ask as to the treatment of old and neglected vines. Pruning ought to be done in the fall, or in the very early spring, long before the swelling of the buds shows that vegetation has started. If the vine is cut after root action has commenced, there is a flow of sap so copious, that it is popularly called "bleeding." While there is a great difference of opinion, as to the injury resulting from bleeding, we are confident that it can do no good, and it is better to avoid it. A grape vine is so tractable, that it

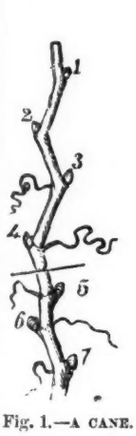


Fig. 1.—A CANE.

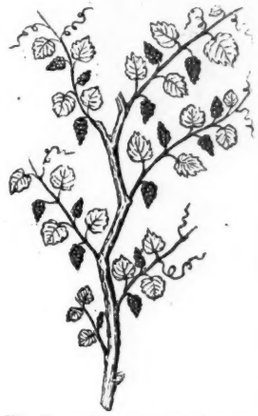


Fig. 2.—THE SAME IN GROWTH.

may be perfectly adapted to a great many places, if we only direct it properly, and to do this, we must learn a few things about its growth, and work in accordance with them. If one clearly understands the manner in which the vine—every grape vine—grows, all mystery and difficulty will disappear. One important point—and one which many who see a vine daily fail to observe, is this: the fruit is always borne upon a shoot of *the present year's growth*. To understand this, let figure 1 represent a young vine, or a branch of an old one, large or small. This branch grew last season, and is just as it was left when the leaves dropped last fall, and as it will be before growth starts this spring. The vine is seen to be in sections or joints; there is a bud, a piece of vine, longer or shorter, according to the variety, or the luxuriance of growth, then another bud, with a piece of vine, and so on, for the whole length. Observe that no two successive buds are upon the same side of the vine; if bud No. 1 is on the right side, No. 2 will be at the left side; No. 3 right, and so on alternating, for the whole length. Unless they have been removed, or accidently broken off, there will be *opposite* each bud, a tendril, or the remains of a stem which bore a cluster the season before. These points where the buds are placed, are properly joints, but we commonly give that name to the portion of vine between two buds, and speak of a variety as "short-jointed" or "long-jointed." The botanists name, for this point of the stem

Fig. 3.—CUT BACK.

where the bud is placed, is *node*—a not difficult name and one that has a definite application. Every branch of vine a year old, or *cane*, as it is called, has its *nodes*, with a bud and a tendril or remains of a cluster at each, and these nodes are separated by longer or shorter joints or *internodes*. When growth

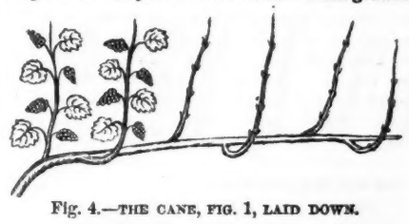


Fig. 4.—THE CANE, FIG. 1, LAID DOWN.

starts in figure 1, the buds will swell, burst open, and a small, tender shoot will begin to lengthen. Examine this young growth; when but a few inches long it will be seen to have nodes and internodes; and at each node a leaf, opposite which is a tendril or a cluster of minute buds, which look like and are often taken for young grapes.

If the cane (figure 1) is untouched, but allowed to grow just as it is, it will soon appear as in figure 2. A shoot coming from each bud, the uppermost shoots, the tendency of the sap being towards these, will be the most vigorous and will grow away rapidly, robbing those below of food. The lower shoots will in this case be smaller and weaker, and some of the lowest buds may not start at all. It will be seen that if a vine is left to itself year after year, the most vigorous shoots, those which bear the fruit, will be further and further away from the root, and the vine will become a tangled mass of weak stems. If instead of allowing the vine (figure 1) to have its own way, we cut it off where the cross line is placed, all the nutriment that would have gone to several shoots will go to the two that remain, and we shall have instead of a vine, like figure 2, one as in figure 3, where there are two strong shoots, bearing their fruit buds down where they are within reach and being better fed, both leaves and fruit, and the shoot itself, will be altogether larger, and more vigorous and healthy. If instead of cutting off figure 1, as here described, we bend it down and fasten it in a horizontal position before growth begins, we shall change the condition of things: the shoots from a more equal distribution of food—or sap—will start more alike; the uppermost can not rob the others. In practice, in making an *arm* in this way, all the buds are not allowed to grow, as they would be too much crowded; but this diagram is merely to illustrate the principle. Let us now suppose that instead of cutting figure 1 back, as in figure 3, or bending it down as in figure 4, we want our vine higher—as soon as the buds have started and have grown an inch or two, we rub or break off all but the two or three topmost buds, as the case may be, and the shoots from these may be carried out horizontally, as in figure 5, or continued in an upright direction as we may prefer. These illustrations are sufficient to show how easily a vine may be controlled and placed where we wish it. Observe that each shoot is but a repetition of the original cane, and that each shoot, when ripe in the fall, will become a cane like figure 1. By fixing these points in the mind: that the growing vine is made up of a succession of joints, furnished at intervals with a leaf and opposite this a tendril or a cluster of grapes, and that these alternate, the matter becomes very simple. The management of the growing shoots must be left for another month.

Fig. 5.—SHOOTS HIGH UP.

THE HOUSEHOLD.

☞ *For other Household Items see "Basket" pages.*

A Framed Calendar.

The almanac, formerly regarded as one of the necessities of every household has in great measure given place to the calender. The ordinary almanac contains much more than one has any use for, and the trouble of turning to the month and day is avoided by using a tablet calendar, or one which gives the whole year on a single page. Calendars are numerous, the various insurance companies, patent medicine men, and even merchants sending them out in great abundance, for the purpose of keeping their names and their business before the eyes of the public. But we do not care to be told that some wizard's "gargling oil" is the only limb preserver in the world, or that life depends upon the use of somebody's pills, especially if we have a regard for our family physician. A year of advertising upon our walls of any thing, no matter how good, is more than we care to give in exchange for a calendar. A calendar can be provided which has none of these objectionable qualities, but may be a real ornament to the room, as well as a convenience to the household. The accompanying engraving suggests such an one that may be constructed by any one who has a taste for home decoration. It consists of a plain card-calendar, which may be prepared from any one of many of those which are so freely distributed, by cutting off the objectionable surrounding border, and leaving a simple truthful card of the months and days. This card is then to be set in a neat frame, which may be constructed in a variety of ways, and of a number of different materials; in fact it allows of the exercise of a wide range of taste.

A NEAT AND CONVENIENT CALENDAR.

The one shown consists largely of the scales of pine cones with clusters of acorns, scattered here and there. For such a frame a foundation of heavy card-board is required which is cut in outline to correspond to that desired in the finished frame, to which the scales are sewed with stout silk thread. As a protection from flies and dust it will be well to cover the calendar with a sheet of glass, which can be secured to the foundation pasteboard by bits of wire or small strips of tin at the four corners, which are hid from view, as is the entire outline of the glass, by the overlapping pine scales. When constructed a handsome finish may be produced by giving the frame a coat or two of varnish.

Bits of Soap.—It was once noticed that a cook, who was neat and economical, kept a tin can on her kitchen dresser from which tomatoes had been emptied. Farther inquiry revealed the fact that it was the receptacle for little odds and ends of soap that had become too small to use in washing. Occasionally, water was added, and the contents put upon the stove until they melted. Thus a tin of soft soap to be used in dish washing was manufactured from scraps that are generally thrown away.

Look Well to the Pork Barrel.

The large amount of tainted, "rusty" pork that is consumed every year is sufficient evidence that it is not, in many cases, packed in a proper manner. That pork may be kept sweet and good, care and good judgment must be exercised. In the first place the barrel into which pork is placed must be perfectly clean. It should be subjected to a scalding as thorough as the neat dairy-maid gives her pails and pans. The old brine will be good to use again if it is boiled and all impurities removed by skimming. The salt used for packing ought always to be the best coarse kind. The pork should never be cut up or laid in the barrel until perfectly cool, but *not frozen*. The pieces should be so cut that the barrel can be closely filled in regular layers. Put on plenty of salt between the layers, and after a few days pour on the brine until the meat is entirely covered, when a close-fitting board is put on and kept down in the brine by a large stone. This board and weight should always be replaced after having taken out pork, and kept on at all other times. The pork, to insure good keeping, must always be submerged in the brine. Keep the pork barrel in a cool place, and let the brine be always saturated, *i. e.*, so it can take up no more salt.

Hints on Household Matters.

BY A DELAWARE HOUSE-KEEPER.

MENDING A CARPET.—My dining-room carpet was only a rag carpet to begin with: latterly it had become a ragged one. I was contemplating it ruefully one day, knowing that the state of my purse would not allow me to replace it just yet with a new one. I could think of no way to mend it, but by big patches tacked in place. In the midst of my dilemma an experienced old lady entered, who suggested paste instead of tacks. "I have repeatedly put muslin patches over the carpet with paste," said she, "and it is surprising how well it holds." I took the hint. Patches are not, in their nature, beautiful, yet a patched garment is decidedly better-looking than a ragged one, and the same is true of a patched carpet, and my patches were so easily applied and proved so adhesive, that I rarely sweep the room without a mental benediction upon the one who suggested it.

CUTTING HOT BREAD.—One day company arrived unexpectedly. Supper was just over and no bread had been left. I had just taken from the oven some delicious-looking light bread, but it was too hot to cut. We live in a country place where there is no baker. In my bewilderment, I happened to remember that in Mrs. Whitney's Cook Book "Just How," she suggests heating a knife, in order to split open a hot short-cake. Why, thought I, may not smoking-hot light bread, be sliced with a hot knife! It is the cold surface of the steel applied to the warm dough that produces a disagreeable clamminess. I heated my carving knife and tried it. The bread sliced beautifully, and as I piled it up to bring to the table, I put it on a plate upon which I had laid a fresh napkin, for the contact of the hot bread with the cold plate would have produced the same sodden clamminess on the surface of the lower slice. Of course, I would not recommend the slicing of hot loaves except upon emergencies. As a frequent diet it might prove injurious, but not more so than other warm breads.

PUTTING AWAY TUBS.—A very little thing, yet worth knowing. One week my regular washer woman could not come, but sent a substitute. When she returned, on the following week, I found her tugging away at a nest of tubs, finding it almost impossible to pull the inner one, from the enclasping outer one. "I never have this trouble," said she, "when I put the tubs away myself."—"How do you avoid it?" I questioned.—"Why do you not see she has put all the handles in a straight line. Now I always set them away, so that no two handles shall come together. Then, if they do swell I can have thorough use of the handles, and with them the tubs are soon separated."

TURNIPS ON THE GRIDDLE.—I had seen for some time a statement going the rounds of newspapers, that a turnip used in rubbing the griddle, while cooking griddle-cakes, would give the desired smoothness and do away with the unpleasant smoke. I doubted it, but a trial soon convinced me that the statement was correct. I found, however, that at times, it was necessary, when beginning, to put a very little grease on the turnip, but this made no appreciable smoke.

RIGHT AND LEFT.—My little boy was left-handed. I had found, by experience, that school-life would be particularly irksome to him, if that defect were not remedied before he began school. It was useless for me to try to persuade him to draw pictures on his little slate with the right hand. That hand was really weaker than the other; he could not guide it. So I made little pictures on the slate, nothing intricate, then rubbed them off with my finger till only the dim outline could be seen. These I required him to trace. The weak hand that could not originate a line, could, little by little, approximate the rubbed outlines. Afterwards, by the same plan, I taught him to write the letters of the alphabet, and by the time he was old enough to go to school, he had learned to use his right hand.

A BABY TENDER.—My baby was creeping all over the floor, and I had no nurse for her. There were times when she drove me nearly distracted. When I was busiest, it seemed to me she crept into the most dangerous places. Just imagine a woman, busy preparing dinner. Except herself, baby is the only occupant of the room. She opens the oven to baste the roasting beef. Just as her entire energies are directed to the operation, baby takes advantage of her stooping position and creeps up on her back. She cannot dislodge the child, and it is with extreme difficulty that she replaces the hot pan without an accident. I frequently found myself in such positions. At last I thought of a remedy, I procured a dry-goods box, or such a box as shoes are generally packed in; its dimensions were as follows: depth half a yard, width fifteen inches, and length one yard. This I put in one corner of the kitchen. Whenever I was particularly busy, I caught up the darling and *boxed* her. She might dislike her close quarters, might struggle to be free, but at least she was safe. But in a little while she did not dislike her prison. She learned to pull up by the sides and look over; she took her first steps supported by its sides, which were at a convenient distance apart; bye and bye, she would walk from end to end in her efforts to be near me as I moved about the room. But it is a clumsy affair. I shall have a much better one for the sitting room: it is to be made of the same dimensions but simply a skeleton frame, except that the floor is to be solid. Upon this frame, which is to be very smooth around the top, I shall tack wire-gauze; the entire stucture is to be on casters, that I may easily roll it about, a long flexible strip is to be tacked from side to side like a basket handle. From this, I shall suspend the toys I find amuse

her, and I rather think my home-made Baby Tender will be a comfort. Some bright bits of Brussels carpet, which I have been saving, will, when nicely bound, come in place as a rug for baby's box.

Household Notes and Queries.

PUTTING DOWN CARPETS.—One of the most tiresome incidents of house cleaning, is the putting of the carpet upon the floor, and so much depends upon its being done well, that it is a matter of no little anxiety with many neat house-keepers. The stretching of the carpet so that it will fit closely to the floor, is the important point. Carpet stretchers of various kinds, may be had at the stores, at greater or less cost, but a home-made one can be constructed in a few minutes, and at little or no outlay. This is made, as shown in the engraving, by nailing a short piece of hard-wood to a suitable handle; into this piece, or *head*, a number of nails are driven, and afterwards sharpened with a file, to form teeth which will catch hold of the carpet. The stretcher thus made, is to be used with a pushing motion, and it will be found to save much strength, keep knuckles from getting sore, and the back from many an ache.

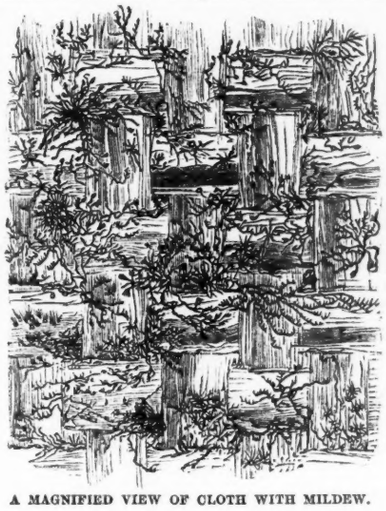
A CARPET STRETCHER.

STOVES, AND THEIR TAKING DOWN, will soon occupy the attention of house-keepers. In many dwellings, the stoves, with the exception of that in the kitchen, are all taken down, and put out of the way at house-cleaning time, and before the end of this month, there will be many a cold sitting room, and generally desolate, not to say sick, household, from this very reason. There are pleasant days in April, and warm, sultry ones in May, but they are followed by cold spells, which call, and often loudly, for a fire in the room, for the comfort and health of the inmates. Of course a stove takes up some space, and a room with the stove removed is more capacious, but when space is obtained at the expense of all comfort in the room, it is bought too dearly. Both comfort and health are in favor of the old principle, of not taking down the stove until its use is at an end, be it at the end of June, or when the stove is worn out. In our changeable climate there is hardly a month without a day on which a little fire at night, or in early morning, is not desirable, especially for invalids, and there should be some room, other than the kitchen, where one may be started at a moment's notice.

IS RHUBARB WHOLESOME?—Every once in a while there appears a newspaper paragraph stating that the acidity of Rhubarb stalks is due to Oxalic Acid, and therefore poisonous. This would be "important if true," but fortunately for those who find in Rhubarb a most acceptable substitute for fruit, it is not true. The acidity is due to a mixture of Malic and Citric acids; the one being the acid of apples and the other the acid of lemons.

Mildew on Cotton Cloth.

Every house-keeper is aware that the unwelcome dark spots known as Mildew, are more apt to appear upon articles of cotton or linen that are starched than upon those which have not been so treated. All cotton goods are starched in their manufacture, indeed before they are manufactured in the sense of being woven. The yarn, as the threads are called, whether it is to form the "weft" or "woof" of the fabric, is "sized" as it is termed, which is simply dressing the yarn with a paste of some form of starch; the fine threads which are wound upon one roller are transferred to another roller that is placed several feet distant from the first. As the threads or yarn slowly pass from one roller, the paste or "size" is applied by means of a brush. The sizing thus applied to a certain extent strengthens the threads, and as it makes them vastly more manageable in the process of weaving it is a proper thing to do. But some weavers having learned that a sized thread was a great deal larger than one not sized, have shown much ingenuity in coating a small thread with a great deal of size, and not only this, but have contrived to add to the sizing China Clay and other substances, and thus coat the threads with a large amount of foreign matter. Cloth woven of such threads, while it appears very close and heavy, when washed loses all this filling and appears in its real character—a poor, thin, slazy stuff, quite unlike that for which it was bought. English manufacturers, especially, have carried on this excessive sizing and filling with goods for the Eastern markets, and for the half savage people in Africa and elsewhere to an enormous extent. One of the first things such people buy is cotton cloth, and wherever American cottons, with only the necessary amount of sizing have appeared in competition with the oversized stuffs, the latter have been driven out of the market. But another trouble has come upon the makers and sellers of highly sized stuffs; they have proved to be highly susceptible to mildew, and great losses have been sustained on account of the injury from this cause. Indeed so important has this matter become to English manufacturers that



A MAGNIFIED VIEW OF CLOTH WITH MILDEW.

a book has recently appeared for their benefit, entitled "Sizing and Mildew in Cotton Goods." We have often shown that the plant mildews, like those of the grape, lettuce, etc., and the various moulds, are really a minute vegetable growth, consisting of plants, so small as to only be seen when highly magnified, but just as much plants as a cabbage or an oak, and like these larger plants they must have something to live upon. The leaf, and other part of the plant bearing these mildews and moulds, are fed upon by these minute plants and their substance broken up and destroyed; so with the cloth mildew; it feeds upon the starch used in sizing, and if it does not feed upon the fibre of the cloth itself, it so injures it as to cause it to decay and become worthless. We may look upon the injury mildew causes these oversized cotton goods without any very great regret, as it is one of many ways of expressing the fact that "honesty is the best policy," and may even find in the mildew a beauty which the dishonest manufacturer fails to see. The work referred to gives illustrations of the mildew as seen by the microscope, one of which is here reproduced. The engraving shows a highly magnified bit of mildewed cloth, in which the threads are shown very large, with the various kinds of mildew plants running over and among them as irregular twisted and knotted lines. "No less than 27 different kinds of moulds and mildews have been detected on cotton cloths." The mildews which annoy the house-keeper are similar in appearance to those here shown. The best preventive of mildew is dryness, as the minute plants can not appear and make their growth without a certain amount of moisture. Fabrics that are to remain for a long time unused should be put away without first starching.

Work with Scroll or Fret Saws.

Within a few years, scroll or fret-saws have been brought to a great perfection, and the use of them, is to some a profitable employment, while to others it affords an attractive and pleasing pastime. The products of the scroll-saw are becoming frequent in household conveniences, and in the decorations of the parlor and drawing room. The windows of store-keepers who deal in these goods, present finely, and frequently elaborately wrought designs on exhibition, which are truly works of art. In the accompanying engravings, two specimens of scroll-work are given—those that workmen of average skill could make in a short time.

Fig. 1.—PICTURE FRAME.

The design in figure 1, is for a carved frame for a cabinet photograph, some small painting, or other picture, the whole to rest on an easel, wrought from the same kind of wood. Figure 2 shows an easel of an elaborate design, with the picture itself in scroll-work. The number of designs, of which those given are but samples, is limited only by the skill of the artist, and that of the workman at the saw. The dealers in scroll-saws, have a very large assortment of suggestive designs, which they distribute freely in the form of sheets and catalogues—and of themselves make a very pretty collection. The uses to which scroll-work can be put in the household, are various; wall pockets, thermometer frames, brackets, card baskets, lamp mats, toilet cases, card holders, etc., etc., are but a few of the many. Those designs that are purely for ornament, can be used to decorate the windows by suspending these near the glass by a fine thread, where they show off to good advantage, both from within and without. But in order to get the very best effect, the scroll-work should be of the whitest of wood, and then provided with a black back-ground. Merchants have in many cases availed themselves of the attractive and pleasing contrast thus produced, by putting their names, or those of their goods, in white-wood scroll-work, and then providing it with a black back-ground, in their shop windows, or show cases. In household decoration, nothing seems more appropriate than black velvet, but any other rich cloth of the same color would answer. Ornamental work like that shown in the engravings, may be of any size, but for ordinary mantels, a background of a square foot in area, is the most acceptable. The whole, when completed, can be placed upon an easel. The low price of scroll saws puts them and their products within the reach of all.

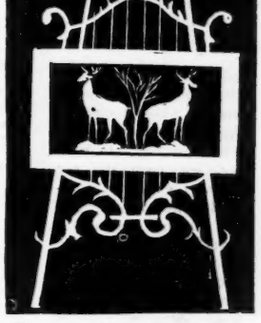


Fig. 2.—EASEL AND PICTURE.

BOYS & GIRLS' COLUMNS.

The Doctor's Talks.

If at play you accidentally run against another boy, you may hurt him, may even throw him down with great violence. But how is it with yourself? I recollect that in some play at ball or other game I ran against a boy I did not happen to see, and while he went down, I struck with such force as to "knock the breath from my body," and I suffered so much for a few seconds that I have never

Fig. 1.—DRIVING NAIL IN A SPRING BOARD.

forgotten it. The boy was standing still, I went against him with great force, sufficient to knock him down, and I was badly hurt. This is one of the earliest illustrations I can recollect of having learned of what is laid down in the books as one of the laws of motion, which is:

ACTION AND REACTION ARE EQUAL.

If you strike the table with the hand, the table reacts with the same force. If you fire a ball from a gun, the explosion of the powder pushes the ball in one direction and the gun in another; the ball goes to a great distance, the gun moves but little. The force of the powder is spent in moving the gun, which is very much larger than the ball, and, if the gun is held close against the shoulder, is communicated to your body also. When you jump from a big rock, you push yourself with a certain force, and by the spring of your knees, etc., throw yourself to several feet away. Now you push the rock with the same force that you do yourself, and through that the whole

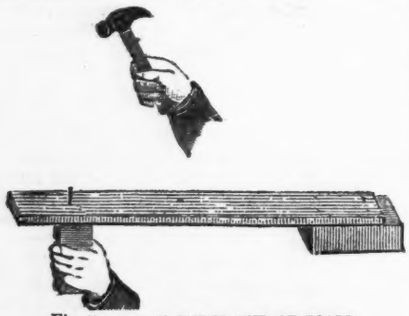


Fig. 2.—BLOCK UNDER END OF BOARD.

earth, but these are so vastly larger than yourself that the motion given to them by your jumping can not be measured. If, instead of a rock, you jump from a small boat, the case will be different, as the movement of the boat will plainly show; indeed, in even stepping from a small boat one has to be very careful else he will be a dripping illustration of the fact that "action and reaction are equal." We see this in the flight of a bird; the bird beats the air down with its wings, the air on the other hand reacts and raises the bird. In rowing, we push the oar against the water; the water in turn reacts against the oar, and the boat is sent through the water. In our talks about Matter and such things, we shall have use for a word, and it is one that we will now and then meet with, which is

MOMENTUM.

If you look in the books to find what Momentum is, you will learn that it is "the mass of a body multiplied by its velocity,"—a perfectly correct definition, but one which may not at first give you a clear idea as to what is meant by Momentum. If I were to say that it is "the amount of *go* there is in a body," it would not be very elegant, but perhaps you would understand it better. It is the force with which a body in motion strikes against another at rest. A stone will easily hold up a hammer; we may press the hammer against the stone as hard as we are able without changing the stone, but with a very quick blow of the same hammer we can break the stone at once; in other words, we have given momentum to the hammer head—and motion joined to weight will accomplish what weight alone failed to do.

A SMALL BODY MOVING SWIFTLY

may have a greater momentum than a large one, going slowly. Even so light a body as air, when moving rapidly, exerts great force, as we see in a hurricane, and water in the form of hail, when rapidly moving, breaks the glass in our windows, and strips the small branches from trees. On the other hand, a large body, though it moves but slowly, has great momentum, and can strike with great force. A ship, moving so slowly that the motion can hardly be seen, will come against the pier with immense force, and if a small boat should chance to get between the two, it would be made into splinters at once. When a body in motion strikes another, it loses its own momentum, and imparts it to the other; if the second body is movable, it will be set in motion; if not, the effects of the blow will be seen in other ways. Boys in their early attempts with tools, learn some lesson about momentum. If they try to drive a nail into the free end of a board, as in figure 1, they find it very difficult; the force or momentum of the hammer does not send home the nail, but merely gives motion to the board; drive as furiously as you may, the nail will not go to its place. An older person may show you, or you may discover it yourself, that simply holding a block under the end of the board, as in fig. 2, will allow you to drive the nail at once. In this case you strike no heavier blows, use no more force. In the first case, the momentum of the hammer was used up in springing the board; in the second, it is received by the nail and block together, with the effect of driving in the nail.

The Doctor's Correspondence.

PASTE FOR SCRAP-BOOK.

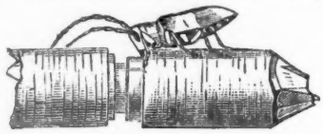
"Sarah M. W.," N. J.—Paste is much better for pasting your materials into a scrap-book than any kind of gum or mucilage. Stir the flour so thoroughly with cold water that there will be no lumps in it, and boil slowly for a few minutes; when cool stir in a few drops of carbolic acid to preserve it. Creasote is said to answer as well.... We have had first and last some very curious examples of insect work, but none that to me seems more wonderful than a bit of stick—a twig of a pear tree that had in it a deep groove three-fourths of the way through, and as nicely cut as if it had been put in a lathe and turned. The gentleman who sent it from Arkansas suspected that it was done by an insect, but he had never been able to catch any at work. He was right in thinking it to be the work of an insect, and for his benefit, as well as to call your attention to it, I give its portrait from Doct. Packard's "Guide to the Study of Insects." The workman, as you see, is a little beetle

CALLED "THE GIRDLER,"

The engraving shows it at work; when the job is finished, the groove is more nicely done than most of you boys could do it with a knife. The insect was first described as long ago as 1825, it being then known to work upon hickory trees; but our Arkansas friend writes that pear trees are most attacked, its next choice is an apple or hickory, and occasionally it attacks the cherry and plum. You do not need to be told that such grooves, however neatly made, are very injurious to a tree; it attacks stems as large as your finger, and of course all that part of the stem above the cut will die. They have not before been known to be abundant, but they seem so in the orchard of the gentleman who sent the specimen.

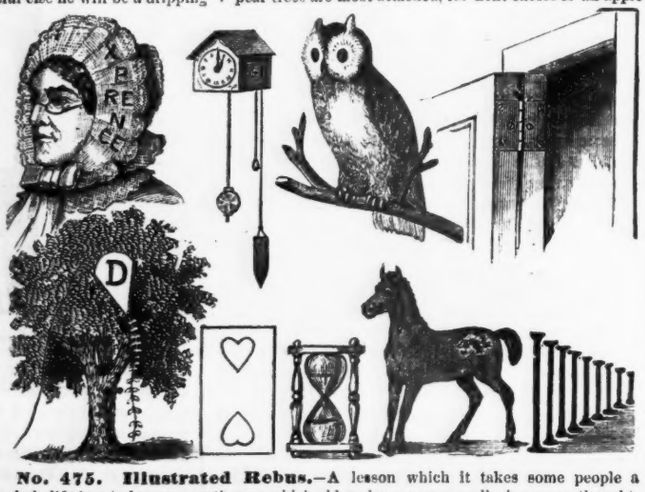
WHY DOES THE INSECT DO THIS?

Some of you may think it is to get food, but the wood is not eaten; if that were the object, she—for it is always the female insect that does the work—could get wood without the trouble of cutting so deep. She does not do it to get food for herself, but to provide her young with food, which must be dead wood, and very curiously she does it. The mother insect makes holes in the twig in



A GIRDLER AT WORK.

which she places her eggs; afterwards she goes below the place where she has put the eggs and cuts this groove, in time the branch dies, and it being held by a very small neck of wood, the winds break it off, but the young Girdlers are all snug within, where they can feed upon dead wood until they have made their growth; in time they will appear as perfect Girdlers, to go on with the work. When the female insect has laid her eggs, and girdled the twig, she dies; she never lives to see her young, but she works on at her girdling, slowly making the groove, a minute chip at a time. Isn't it wonderful, this foreseeing the wants of her young and providing for them in this strange and peculiar manner!



No. 475. Illustrated Rebus.—A lesson which it takes some people a whole lifetime to learn: a truth over which old and young can well give some thought.

Our Puzzle-Box.

WORD-MAKING PUZZLE.

(In the following lists of words, one word in each list is to have the letter at the end of the list added to it, and with it be transposed into another word.—*Example.* List:—boy, reprobate, ladder, rock, stone, reassure, by; letter, H. The word in the list to which the letter H can be added, is—"stone;" with H, it can be transposed into *honest*.)

1. List: batter, fire, engine, gruel, sense, in, nonsense; letter—U.
2. List: muslin, embroidered, shirt, vest, house, apiece, toy; letter—T.
3. List: dread, Indians, bugbear, onto, mouth, cotton, adapt; letter—M.
4. List: copse, gate, letters, valued, bit, love, future, galley; letter—N.
5. List: history, tale, twice, mine, oyster, knife, incrust; letter—V.
6. List: book, perusal, picture, incur, my, magic, gather; letter—E.
7. List: cow, student, cant, convoke, coo, hexagon, poetry, bond; letter—I.
8. List: open, volume, butcher, veal, suet, hearth, audit; letter—P.

CROSS-WORD.

My first is in awful but not in grand,
My second is in pasture but not in land,
My third is in orange but not in plum,
My fourth is in finger but not in thumb,
My fifth is in chapter but not in verse,
My sixth is in patient but not in nurse,
My seventh is in prison but not in cell,
My eighth is in clapper but not in bell,
My ninth is in poison but not in bane,
My tenth is in torture but not in pain,
My eleventh is in cracker but not in bun,
My twelfth is in pleasure but not in fun;
And now you may look
In your picture-book,
And the first one you see
Is sure to be me.

NUMERICAL ENIGMAS.

I am composed of 16 letters:
My 1, 6, 11, 10, 16, 5, is the name of a river.
My 14, 12, 4, if you eat it will make you shiver.
My 12, 2, 16, 4, 16, is what many like to eat.
My 5, 13, 11, 10, is nothing but a cheat.
My 12, 2, 7, 15, is a part of your face.
My 11, 1, 6, 16, 8, 5, is the name of a place.
My 8, 11, 10, 4, is what you have, so have I.
My 4, 11, 3, 11, 12, 6, 4, often makes infants cry.
My 9, 11, 10, 16, 5, are what a number play.
My 10, 7, 8, 4, is dark and dismal, so they say.
My 10, 11, 14, 8, 4, is the name of a State.
My 9, 11, 1, 4, is where lovers often wait.
My 9, 3, 11, 10, 10, 11, 8, is a useful book.
My 10, 4, 11, 1, is what women often cook.
My 3, 11, 7, 8, is what all nations need.
My 5, 10, 11, 3, 1, is the name of a weed.
My whole is what all farmers need,
Without it they must work indeed. A. B. S.

2. I am composed of 11 letters:
My 7, 1, 4, 9, 11, is a level territory.
My 1, 9, 11, 3, 6, 5, 11, is the name of one of the Presidents.
My 7, 2, 10, 5, is a collection of water.
My 7, 5, 4, 8, is a sketch of a piece of ground.
My whole is a subject much agitated. J. B. K.

ANAGRAMS.

1. A daily W.
2. Emil Ulu.
3. Don't hug us.
4. Away! Scat!
5. Rob fed a hen.
6. Nice Lyne.
7. Pet relation.
8. A cane by E.
9. Only a duel.
10. In a strap.

SQUARE WORD.

1. A noted confederate in the late war.
2. To stay.
3. A large violin.
4. A lazy man.
5. Dries.

LITTLE FOLKS.

CONCEALED INSECTS.

1. She had long, natural curls.
2. But wore a high comb, ugly frizzes and puffs.
3. I want to start early to the lecture.
4. Bring rubber shoes and an umbrella.
5. I think of lying down till you return.

PI.

Het laroy barrily fo Pisar sintocan wot limnoli mulsove dan oebjots fo veery notipridesc. Het gruelra naunla ceaserin si wytent dousnath. Rylane fual a limnoli sokbo ear cheufr thisroy, noly wettyn hutsodan shilgen tosyhir; gulytohe mesburn owt dundher toushand; dan ni encices dan sholohippy heret car entiny nadushot semulvo. Pretind cauntisetsy castagoule car shunfired.

ANSWERS TO PUZZLES IN THE FEBRUARY NUMBER.

HALF SQUARE.

A P R I L
P L A N
R A T
I N
L

NUMERICAL ENIGMA—BIBLICAL PROVERBS.—For wisdom is better than rubies; and all the things that may be desired are not to be compared to it.

CHARADE.—Anthem.

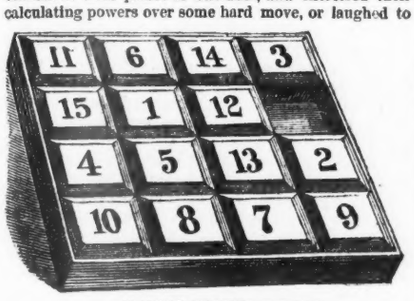
NUMERICAL ENIGMA.—In the voyage of life, Content is the safest pilot.

WHEN	BRED	ABBE
HERO	RODE	BOAR
ERST	EDEN	BARS
NOTE	DENT	ERST

ABBT	COAT	DROP
BEAR	OORE	ROPE
BASE	AREA	OPEN
TREE	TEAR	PENS

A New Puzzle.

Whoever visited New York in February last must have met at every street corner men and boys doing a thriving business in selling a new game or toy known as: The "Sliding Number Puzzle." This game, which is for a single person, and therefore a *solitaire*, consists, as the engraving shows, of a box into which 16 small square blocks of wood fit quite closely. Upon the upper face of each block is a number, and these run from one to sixteen. When the puzzle is to be worked, one of the blocks is removed (the one having "16" upon it), and the others are placed face down upon the table, and mixed as in the stirring or "shuffling" of dominoes. The blocks being well mixed, are then placed in the box just as they are picked up, beginning at the upper left-hand corner, and filling to the right. When all the 15 blocks are in, there is a single space vacant, and this allows of a sliding of the blocks—one at a time, and of course through only one space. The trick, or puzzle, is to so move the blocks that they will be finally brought into the regular order of the numbers upon them—that is, block "1" is in the upper left-hand corner, "2" next at its right, and so on until "15" is reached at the end. So far as the explanation of the puzzle is concerned it is very simple, but to get the blocks into the regular order is quite another thing. Some persons, after having spent several hours, and even days, have been unable to get them right, while others have succeeded in doing it after a few minutes. Of the latter, it may be said it was all guess work, and the next time they try, it may take them a much longer time. The possible arrangement of blocks as they are placed hap-hazard in the box, are so numerous, that it is safe to say that they can never be twice alike; therefore the movements are different in every succeeding "game." It is interesting to see how much "taken" people have been with this puzzle, bankers and business men have stood in groups at the entrances of their places of business, and exercised their calculating powers over some hard move, or laughed to



THE SLIDING NUMBER PUZZLE.

see some one else move and move again, and not make the least particle of progress. The puzzle took with the boys at once, who freely invested their dimes and half dimes—the puzzles being of various sizes, shapes, and prices, to suit the demands of the trade. In our first trial of the puzzle we failed, but in a second attempt, about half an hour of "shoving around" brought all the blocks to their proper places. The boys and girls of the *American Agriculturist* family will be interested in this puzzle, we think, and as we understand it is not patented, any boy can make one for his own and other's amusement; the engraving will show how it is made.

A Bed of Mixed Plants.

Misery is said to make strange bed fellows, but misery has nothing to do with bringing these plants together in the same bed, though they may be "strange," as some of the plants have probably never met each other before. In this respect there is a newness about our bed that may give it interest. There are no paths—no regular ways to go on our round of inspection—and therefore we are at liberty to "go as we please." As the plan of planting is not of the formal style, our ramble may also be irregular, and if the first plant that gains our attention is not in one of the four corners, it will make no difference.

No. 1. There is a little low plant that often covers the moist ground along the edges of woods, with its pale-green mottled leaves dotted with purple, and suggesting the tongue of some reptile, and one of the common names of the plant. From between the leaves the slender stalk runs up, and bears on its end a yellow lily-like flower, and of such size and weight as to cause it to hang its head as if in modesty. It generally figures largely in the bouquets which children bring in from the woods in early spring. We have never seen a dog try his teeth on this plant, the color of which is far from violet.—No. 2. This is the representative of a *genus*, or little group of kinds of plants, ten of which are found in the Eastern U. S., some flowering as early as April, while others prefer the hot month of July for showing the regular pretty flowers which are sometimes quite showy because borne in large clusters. A tall kind is very generally found in old flower gardens growing in clusters, the stalks small and straight, ending in a large oval cluster of showy purple flowers. A low kind flowers early, and covers the ground with a mat of mossy pink, also common in cultivation.—No. 3 is a shrub that grows in large clumps in low places, the young shoots being highly prized for whips by boys, and in spring used for making whistles. The flowers are very small, but hang in long soft bunches, which, from their shape and feeling, might remind one of the bushy tail of a squirrel or a cat. The color is yellow, as also is the bark of the twigs, and the bees and other insects are very fond of the flowers, from which they gather much sweet. The plant would be a little out of place in a well kept flower garden.—No. 4. While we are in the low, moist ground, let us notice another and a very different plant, far more attractive from the strange form and coloring of its cluster of flowers than the flavor of its large turnip-like stem below ground. Those who have tasted of this plant seldom like to repeat the experiment. The leaves are usually two in number, and like those of the ordinary clover, composed of three parts, but very much larger. The hood-like richly colored covering to the fleshy flower cluster is very peculiar, and from the arrangement of floral parts the common name is derived.—No. 5 is a particular favorite in spring window gardening; growing from a bulb, and often put in tall and neat glass jars. When in bloom the large flower cluster makes up the principal part of the plant, the individual flowers may be of almost any shades of color, waxy in texture, and extremely fragrant.—No. 6. When children get together in the pasture or along the roadside they are quite sure to pick the bright yellow flowers of number 6 and place them under the chins of their companions to determine the fondness which the one examined has for a certain article of food. The juice of the plant is not agreeable to the taste.—No. 7, the botanists say, is a near relative of the last, though the leaves are of a different shape, and the flowers entirely different in outline, much more showy, each possessing five long tubes, in the bottom of which a little drop of honey is to thus reach the nectar. This is one of the most showy of wild spring flowers, and is fond of growing on some be found—provided some busy bee has not made his early visit and extracted it. Bees are getting very wise, and some of them, instead of taking the trouble to crawl head first into the tube, just punch a hole near the bottom, and

A COLLECTION OF STRANGE LOOKING PLANTS.

rocky cliff just out of reach of those passing below. It is not of a nature to bind itself very closely to a column.—No. 8. A very delicate plant is often found in the woods in early spring, with slender branches and peculiar heart-shaped, scattered flowers. There are two broad spurs to each flower, and as they hang and dangle on their slender supports, they may remind one of a garment hung up as a sign in front of a clothing house in Holland.—No. 9. Again we return to the plants of the lily tribe, and this time to one which frequents rich ground, as along low river banks, where it grows to some five feet in hight. The flowers are small, but make up for their size in number. The stem grows from a creeping one beneath the soil, and as the stem above ground dies at the end of the year it leaves a scar, so that by digging up the stock the age of the plant in years can be determined by counting the scars. The mark or scar resembles the impression made by a stamp. Just why the common name of this plant should be associated with that of a very wise man of old is more than we can tell.—No. 10. Here is a pretty little plant, and one that is so small that we should overlook it were it not for the delicacy and beauty of its very early flowers, coming out so soon as the snows have cleared away from the margins of the woods. Small as it is, it is the welcome friend of every seeker of early gems.—No. 11 is one of the earliest of garden plants to send up its flower to cheer us, and is so near a relative of the Daffodil that we are not sure but they are almost twin sisters.—No. 12. This is not a handsome plant; it grows in damp places, and is quite common. The flowers are rather large, varying in color from white to purple. The mouth of each blossom is nearly closed, and from this, and the size and shape of the flower, it resembles quite strongly the head of some animal.—No. 13 takes its common name from the long, slender, yellow, bitter, fibrous roots which this plant has in great abundance. The leaves are evergreen and shiny. It is a bog plant, with small white flowers, which are not expected out until May.—No. 14. A standard garden plant, with pretty flowers of a characteristic shade, and the name of the plant is the accepted name for the shade of color which the flowers often possess.—No. 15 is not at all attractive, and we put it here as a sort of contrast to the showy plants which are in the bed around it. The common name is derived from the shape of the young pod, which in outline resembles that of the head-dress

THE OLD BIRD AND HER LITTLE ONES THAT LIVED IN A SHOE.

of a high officer in the church.—No. 16. The flower of this is bell-shaped; perhaps it is not wort(h) while to speak further of this.—No. 17. Old neglected cultivated grounds and places in meadows and pastures not occupied with a turf generally abound in this plant, which grows into a bushy herb with a great abundance of small flowers produced through all the season. After the flower comes a pod of small size, the shape of which suggests a part of the name.—No. 18. When a name is so generally applied as to include a number of kinds of plants, it becomes difficult to describe it—but it is safe to say that it is a rough looking plant with a head of flowers on the same plan as the sunflower, only much smaller.—No. 19. The tour among the plants of the flower bed is closed with the notice of the most poetical member of the collection. Though small as a plant, its flowers are large and particularly striking in their appearance, suggesting the human face to those who are at all imaginative. It probably has more common names than any other flower, and one of these implies that it can bring quiet to an important organ of the human body.

Birds and Nest Building.

The first fresh note of the earliest bird, as it comes to one's ears on the still morning air, is full of joy and gladness. After a long and cold winter, anything that tells us that spring is at hand, is very welcome. The spring birds mark a place on the memory of every farmer's child; and if I am not entirely mistaken, the farmer himself is touched and made glad by the sweetness and new life which the returning songsters bring from their Southern winter homes. The Chickadees, Snow-birds, and a few others, remain with us through the winter, and all are thankful for their cheering presence; but it is only when the warm spring days fill the air with the voices of the new comers, that bird life is at its best. The twittering Swallows, the pretty Blue Birds, the sprightly Thrushes, the noisy Bobolinks, and the whole list, bring back the realities of a growing season. After the return, and the general, and generous serenade is over, the active duties of bird house-keeping are uppermost in the minds of the members of the feathered tribe, and in these, and the busy preparations for the same, the greatest charm of bird life consists. In nothing do birds show more tact, skill, forethought, intelligence, and all the other qualities which make them take such a rank, than in the building of their nests, and the rearing of their young. Each kind of bird has its own peculiar way of forming its nest, selecting those materials best adapted to its wants. The Eagle finds some crag, high up out of the reach of its foes, and then in the solitude of the upper air, builds its coarse nest of sticks and moss, and brings forth its well protected young. The little Humming-bird constructs her thimble-like nest, with the greatest nicety, using only the softest of materials; and with a nature very unlike that which we should look for in so small a creature, defends her home with a courage and success, that would put to shame many another two-legged animal, not graced with fine feathers, or fine feelings. The black, unmusical, hated, hunted bird, familiarly known as the Crow, loved by none, shot at by all who can get within its range, poisoned by many, and a great lover of early corn, does not build its nest upon the ground, or within the easy reach of man. The school boy who would rob Crows' nests, can spend much time in climbing large and lofty trees, and must possess a great degree of courage, to insure success. It is better for him to go after school if he goes at all, as he will then be sure of the day's schooling. If boys will confine their nest-robbing, and bird-hunting, to such kinds as the Crow, but very little harm will be done to our birds. To any who will put a cruel hand to the home of the many innocent and useful birds, I would suggest that they receive from their parents that impressive instruction that the meanness of their conduct demands. A bird in a boy's hand, is not worth two that are out of his reach. If children were not so inquisitive—did not have such a strong desire to see and know things—it might be, in some cases, all the more pleasant for the birds. This I know from my own experience. The innocent "ground birds," unsuspectingly find some place at the foot of a bush, or under the edge of a sod, and out of grass, hairs, feathers, thread, wool, cloth, etc., make a nest that the feet of passing cattle, or the hands of evil boys can quickly destroy. The Robin—a bird loved at all seasons, except when the cherries and other small fruits are ripe—builds its nest in a variety of situations. In my boyhood days, it seemed to have a peculiar liking for the corners of old rail fences, and very good places they were in more senses than one. I have watched the whole process of nest-building, from the simple mud foundation, up to the generous, and well-shaped completed home. Then climbing up, with the old bird dashing at my head, saw that there was one egg, then the two, the three, and finally the four—frequent calls being made just to see how everything was getting on. Twelve days later, the little robins broke the thin blue walls of their prison, and the light of a new world came into their inexperienced eyes. I confess to aiding them a little in this transformation scene, and to helping the mother bird feed these great-headed, big-mouthed, piping, hungry, homely, half-covered younglings, while the harassed mother cried (we may suppose) in a loud voice; "These are *my* little ones: torment me no more." I have a weakness for nest building, and no longer ago than last spring, a pair of birds built a nest in a pear tree, but a few feet from one of my windows, and if the truth was told, some one kept well posted on the progress of the work; and for this the owners may have reason to be grateful, as one day a boy was found molesting their quiet reign, and the youth was soon led to see the error of his way—and that to his own home. Luckily the birds and nest were unharmed, and in due time a family was raised. One ambitious fledgling was saved from the "jaws of death" (cat), by human hands, and the wisdom of not leaving home too early in life, was impressed upon the other members of the household. The nest to-day is in the leafless branches of the tree, waiting, it may be, to be refitted in a few days, and occupied by its former owners.

The accompanying engraving shows but one of the many ways in which old things are turned to good account, by the ingenuity of birds. An old shoe has made a most acceptable home for a little feathered family. Having served its day as a cover for some foot, it now becomes a protection to a number of little feet, along with the bodies attached to them. Unlike the old woman who dwelt in the same style of a home, the mother bird, with a goodly brood, seems to know what to do with her children. She may experience more trouble a little later in the season, when they become more independent, and are out from under her wings—When they get out of the shoe, I suppose they step in by the way of the *in-step*; of course, one can not be *shoe-r* of this. UNCLE HAL.

THIRTY-FIFTH ANNUAL REPORT

OF THE

New-York Life Insurance Company,

Office, Nos 346 & 348 Broadway.

JANUARY 1, 1880.

Amount of Net Cash Assets, Jan. 1, 1879, - - - - - $36,213,457.61

Less deduction to cover decrease in value of U. S. Bonds and other assets..... $135,966.93

$36,077,490.68

REVENUE ACCOUNT.

Premiums	$6,382,875.25	
Less deferred premiums January 1, 1879	379,839.09	$6,003,036.16
Interest and rents	2,339,815.93	
Less interest accrued January 1, 1879	306,225.93	$2,033,650.00—$8,036,686.16

$44,114,176.84

DISBURSEMENT ACCOUNT.

Losses by death, including Reversionary additions to same	$1,569,854.22	
Endowments matured and discounted, including Reversionary additions to same	1,015,256.22	
Annuities, dividends and returned premiums on cancelled policies	2,236,379.97	
Taxes and re-insurances	173,608 64	
Commissions, brokerages, agency expenses, and physicians' fees	626,258.30	
Office and law expenses, salaries, advertising, printing, etc	307,392.81	$5,928,745.16

$38,185,431.68

ASSETS.

Cash in bank, on hand, and in transit (since received)	$ 1,961,701.48	
Invested in United States, New York City, and other stocks, (market value $14,356,192.94)	13,544,671.96	
Real estate	4,974,573.68	
Bonds and mortgages, first lien on real estate (buildings thereon insured for $14,287,000.00, and the policies assigned to the company as additional collateral security)	15,313,278.95	
Temporary loans, (secured by stocks, market value $1,300,000)	850,000.00	
*Loans on existing policies (the reserve held by the company on these policies amounts to $3,160,000)	921,403.02	
*Quarterly and semi-annual premiums on existing policies, due subsequent to Jan. 1, 1880	367,989.02	
*Premiums on existing policies in course of transmission and collection (estimated reserve on these policies $330,00); included in Liabilities)	211,625.23	
Agents' balances	22,199.23	
Accrued interest on investments Jan. 1, 1880	317,989.11	$38,185,431.68

*A detailed schedule of these items will accompany the usual annual report filed with the Insurance Department of the State of New York.

Excess of market value of securities over cost 811,520.98

Cash Assets, Jan. 1, 1880 - - - - - - - - $38,996,952.66

Appropriated as follows:

Adjusted losses, due subsequent to Jan. 1, 1880	$225,662.64	
Reported losses, awaiting proof, etc	213,271.31	
Matured endowments, due and unpaid	32,780.98	
Reserved for re-insurance on existing policies; participating insurance at four per cent Carlisle net premium; non-participating at five per cent Carlisle net premium	34,016,840.82	
Reserved for contingent liabilities to Tontine Dividend Fund, over and above a four per cent reserve on existing policies of that class	1,371,482.18	
Reserved for premiums paid in advance	16,543.25	$35,876,581.18
Divisible Surplus at four per cent		3,120,371.48

$38,996,952.66

Surplus, estimated by the New York State Standard at 4 1-2 per cent, over.....$7,000,000.00

From the undivided surplus of $3,120,371.48, the Board of Trustees has declared a Reversionary Dividend to participating policies in proportion to their contribution to surplus, available on settlement of next annual premium.

DURING THE YEAR, 5,524 POLICIES HAVE BEEN ISSUED, INSURING $17,098,178.

Number of Polices in force	Jan. 1, 1876, 44,661.		Amount at risk	1876, $126,132,119.	
	Jan. 1, 1877, 45,421.			1877, 127,748,473.	
	Jan. 1, 1878, 45,605.			1878, 127,901,887.	
	Jan. 1, 1879, 45,005.			1879, 125,232,144.	
	Jan. 1, 1880, 45 705.			1880, 127,417,763.	
Death-claims paid.	1875, $1,524,815.	Income from Interest	1875, $1,870,658.	Divisible surplus at 4 per cent.	Jan. 1, 1876, $2,499,654.
	1876, 1,547,648.		1876, 1,906,950.		Jan. 1, 1877, 2,626,816.
	1877, 1,638,128.		1877, 1,867,457.		Jan. 1, 1878, 2,664,144.
	1878, 1,687,676.		1878, 1,948,665.		Jan. 1, 1879, 2,811,436.
	1879, 1.569,854.		1879, 2,033,650.		Jan. 1, 1880, 3,120,371.

TRUSTEES:

MORRIS FRANKLIN,	H. B. CLAFLIN,	HENRY BOWERS,	WILLIAM H. BEERS.
WM. H. APPLETON,	JOHN M. FURMAN,	LOOMIS L. WHITE,	CHARLES WRIGHT, M. D.,
WILLIAM BARTON,	DAVID DOWS,	ROBERT B. COLLINS,	EDWARD MARTIN,
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EDW. A. WHITTEMORE,	HENRY TUCK, M. D.,	ALEXANDER STUDWELL.	

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WILLIAM H. BEERS, Vice-President and Actuary.

THEODORE M. BANTA, Cashier.

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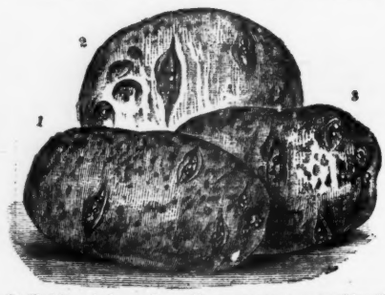

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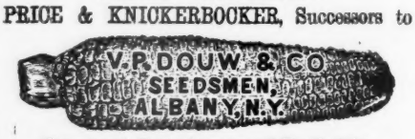

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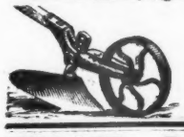

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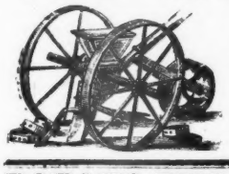

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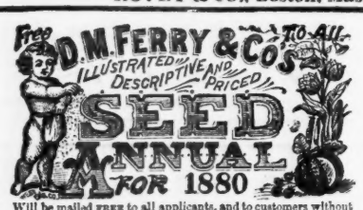

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containing a great variety of Items, including many good Hints and Suggestions which we throw into smaller type and condensed form, for want of space elsewhere.

Continued from Page 133.

In justice to the majority of our subscribers, who have been readers for many years, articles and illustrations are seldom repeated, as those who desire information on a particular subject can cheaply obtain one or more of the back numbers containing what is wanted.

Back numbers of the "American Agriculturist," containing articles referred to in the "Basket" or elsewhere, can always be supplied and sent post-paid for 15 cts. each, or $1.50 per volume.

The German Edition.—All the principal articles and engravings that appear in the *American Agriculturist* are reproduced in the German Edition. Besides these, there is a special department, edited by an eminent German cultivator. Our friends can do us a good service by calling the attention of their German neighbors and friends to the fact that they can have the paper in their own language, and those who employ Germans will find this Journal a most useful and acceptable present.

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Terms to New South Wales, New Zealand, Australia, Africa, etc.—To several inquirers. Under the latest revision of the Postal Union Regulations the price of the *American Agriculturist* (either English or German edition), including postage *prepaid* through, will be covered by 7 shillings sterling, per annum. This applies to the above countries, and to all others embraced in the General Postal Union. The simplest mode of remittance is by Postal Money Orders, payable in London, to the order of Orange Judd Company. These can be readily cashed in N. Y. City at a slight discount, which the publishers will cheerfully pay. For Club rates, (postage included), see our second cover page, and reckon 22 cents to the shilling sterling.

Some Fish Hooks.—It is reported that a single factory at New Haven, Conn., made 23,000,000 fish hooks during last year. If these averaged 1¼ inch each, and were laid down end to end, they would extend 544 miles, or about from Washington to Boston. If only an inch long, they would extend 363 miles, or just the length of the Erie Canal from Albany to Buffalo.

The Western National Fair Association.—The first show bill announcement for a fair for the coming autumn, is from the enterprising State of Kansas. It is of a new organization with the title of "The Western National Fair Association," and is to hold its first exhibition at Bismark Grove, near Lawrence, Sept. 13-18. Over $30,000 in premiums are offered, and the largest agricultural and industrial display ever made beyond the Mississippi is anticipated.

Old Fruit Cans.—If we should bring together and present in one article, all the various devices for utilizing old fruit cans, that we have published in the last 20 years, it would be a curious array. Every now and then a new method is added to make these cast off affairs of service. The latest comes from Baltimore. A friend there draws upon them for a supply of tin. By heating sufficiently to melt the solder, the tops and bottoms come off, the joint at the side opens, and the pieces that formed the body of the can are flattened out, and kept in stock. Is a patch needed under a shingle, does a knot hole or a rat ditto need to be stopped; does the horse gnaw the wood-work of the stable? A piece of tin is the remedy.

"Spring Poor."—No animal should be permitted to fall off in flesh during the winter from lack of food and care. Especially important is it that the horses—upon which the spring work falls so heavily—should be in good trim when the spring opens; in good flesh, good health, and of course, as a consequence, in good spirits.

Catalogues Received.

Catalogues are many—space is narrow. Our friends must be content with the briefest acknowledgement.

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R. H. ALLEN & Co., 189 and 191 Water Street, N. Y.—Neat and full. Grass and Farm Seeds a specialty.

J. H. ANDRE, Bingham's, Tioga Co., N. Y. A special Potato catalogue.

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WM. E. BOWDITCH, 645 Warren Street, Boston, Mass. Fully illustrated. Numerous novelties.

HENRY A. DREER, 714 Chestnut Street, Phila. Full, with a long list of novelties.

J. A. EVERITT, Watsontown, Northumberland Co., Pa. General Seed list, with several new Potatoes.

WM. L. FERRIS, JR., Poughkeepsie, N. Y., offer seeds, with the *American Agriculturist* as a premium.

JOSEPH HARRIS, Moreton Farm, Rochester, N. Y. A select list of Farm, Garden, and Flower Seeds.

R. D. HAWLEY, Hartford, Conn. Vegetable and Farm Seeds and Implements.

HOVEY & Co., 16 South Market Street, Boston, Mass. One of our oldest houses, but wide awake for all novelties.

F. E. MCALLISTER, 29 Fulton Street, N. Y., sends his wholesale trade catalogue in English and German.

A. C. NELLIS, Canajoharie, N. Y., makes of his catalogue a "Floral Instructor," and very full it is.

PRICE & KNICKERBOCKER, 80 State Street, Albany, N. Y. "Surprise" Musk-melon, with other specialties.

W. W. RATHBONE, Marietta, O. Special list of Sweet and other Potatoes.

W. H. REID, Rochester, N. Y., calls his handsomely illustrated catalogue, "A Key to Success in the Garden."

H. N. SMITH, Sudbury, Mass. A select list.

JAMES VICK, Rochester, N. Y. While his catalogue is called a "Floral Guide," it does not omit Vegetables, and is full of pictures.

NURSERYMEN.

BRIGGS ARNOLD, Rockland, Mass. Grapes, especially the "Rockland Favorite."

A. T. BLAUVELT & Co., Blauveltville, Rockland Co., N. Y. General Fruit and Ornamental Stock.

BUSH & SON & MEISSNER, Bushberg, Jefferson Co., Mo. Grape-vines, full and admirably condensed.

M. CRAWFORD, Cuyahoga Falls, Ohio. Strawberry list, with treatise on culture.

ELLWANGER & BARRY, Rochester, N. Y. A general descriptive Fruit catalogue, with illustrations of novelties and a special strawberry list with cultural directions.

W. L. FERRIS, JR., Poughkeepsie, N. Y. General Fruit stock and several new Grapes.

FRANK FORD, Ravenna, Ohio. Small Fruits; new Apple.

A. HANCE & SON, Red Bank, N. J. Trade Price List and surplus stock at very low rates.

DAVID HILL, Dundee, Kane Co., Ill. Evergreens and Ornamental Tree Seedlings.

D. E. HOXIE, Northampton, Mass. Small Fruits; all kinds.

THOS. JACKSON, Portland, Me. General Fruit list and ornamental stock, especially Evergreens.

KELSEY & Co., Saint Joseph, Mo., sends wholesale price list of a full stock.

SAM'L KINSEY, Kinsey's Station (Near Dayton), Ohio. Wholesale list of Fruit and Ornamental Trees.

WILLIAM H. MOON, Morrisville, Pa., sends a general catalogue and a special Strawberry list.

JOHN C. NELTOE, Turner Junction, Ill., has several neat, condensed lists of Strawberries, Small Fruits, etc.

PARSONS & SONS Co., Flushing (L. I.), N. Y. General catalogue and special list of New and Rare Plants.

CHAS. S. PRATT, North Reading, Mass. Descriptive list of Strawberry Plants.

SHEARMAN & MAJOR, Bricksburg, N. J. General assortment; Peaches and Strawberries as specialties.

STORRS, HARRISON & Co., Painesville, Ohio. A general illustrated and an abridged list of an immense variety.

THOS. J. WARD, St. Mary's, Ind. Evergreens, Small Fruits, etc.

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C. E. ALLEN, Brattleboro, Vt. Has a combined Plant and Seed catalogue, with novelties in both.

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DINGEE & CONARD Co., West Grove, Pa. Make a specialty of Roses, and give a new guide to their culture.

HENRY A. DREER, 714 Chestnut St., Philadelphia. A full Greenhouse stock. Many novelties, especially in Coleus.

ELLWANGER & BARRY, Rochester, N. Y. A descriptive catalogue of Greenhouse and other Plants, and a special Rose catalogue.

GREENBROOK & PATERSON NURSERIES, Paterson, N. J. Supplement to general catalogue, and rich in Orchids, etc.

ROBERT J. HALLIDAY, Baltimore, Md. Very full illustrated list, with many novelties.

W. A. HARKNET, Dubuque, Iowa. New Seedling Geraniums and general assortment.

CHAS. T. STARR, Avondale, Pa. Makes a specialty of Carnations, but has everything else.

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JOHN STEPHENS, Circleville, Ohio, sends a full and complete catalogue (for a beginner) of Greenhouse and Bedding Plants.

J. M. THORBURN & Co., No. 15 John Street, N. Y. Special catalogue of Gladiolus and other spring Bulbs.

WOOLSON & Co., Passaic, N. J. Hardy Perennials in great variety, also Native Plants, including Ferns, etc.

WM. C. WILSON, 45 West 14th Street, N. Y. A Seed catalogue is added to the immense list of Plants, which, as usual, has many novelties.

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MAPES' FORMULA AND PERUVIAN GUANO Co., 158 Front Street. Mapes' Complete Manures, Peruvian Guano, etc.

A. H. WARD, Bridgewater, Mass. Agricultural Chemicals and Special Fertilizers.

The Mapes Complete Manures.—Those interested in the question of fertilizers, will find this pamphlet instructive reading. In the Reports of the *American Agriculturist* Fertilizer Experiments, the number of crops to which chemical fertilizers were applied, is limited, while the pamphlet in question gives the result of their application to almost every crop grown in our climate. The results with Cauliflower, Onions, and other "truck" crops, show that stable-manure is not the only fertilizer that can be profitably used upon them. There is no secrecy about the composition of these fertilizers; if there were, we should say nothing about them.

Life Insurance A Duty.—Every man has or ought to have some care or pecuniary responsibility for others resting upon him—for wife, or children, or friends, or for some public enterprise. And no man can drop off suddenly by death, as every one is surely liable to do, without danger that his family, or perhaps his creditors would be embarrassed, unless he be one of the few who have ample supplies of registered government bonds to more than offset all possible contingencies of fire and flood, of financial panics, or the failure of others. Wide extended observation and carefully prepared statistics show with almost absolute certainty how many persons out of every ten thousand will die annually. It is a very easy matter, therefore, for a company of persons to unite, and by mutual contribution to a common fund provide for the bestowal of a given sum to the family or creditors of each one who shall drop out by death during any year. Take the figures on page 155 in illustration. We there find 45,715 persons contributing an average of $140 a year, which, with the interest from the already accumulated great fund of nearly 40 million dollars, is sufficient to secure to each person who dies an average of $3,000, and except in very rare years of extraordinary mortality, there is a large surplus to be divided among the contributors, or to be deducted from their next year's payments. A man of 30, having a wife or children, or aged relatives, or creditors depending on him, can have in store for them $1,000 for each $22.00 he annually contributes to the general fund, less his share of the dividends. The fact that he has this provision made will often be a strong help to his recovery from illness, by lessening his anxiety and worry about those he may leave behind him. Those not already fully insured should write to one or more of the large and well managed Companies like the N. Y. Life, whose Reports appear from time to time in our columns, and get and study their tables, explanations, etc., which are furnished gratuitously to those desiring them.

London Purple.—If we mistake not, the *American Agriculturist* was the first to call attention to London Purple, as a substitute for Paris Green, as an insecticide. Last season's experience of a large number of prominent cultivators, is now made known, and more than sustains all that was claimed for it, not only in destroying the "Potato Bug," but in depriving the Canker Worm of its power of destruction. The testimony of Prof. Riley as to its power of destroying the Cotton Worm, is most important; during his investigations in the cotton-fields last summer, London Purple was thoroughly tested in Georgia, Alabama, and Texas, and was found to kill the Cotton Worms, without injury to the plant. Prof. R. advises using it with water, mixing half a pound with 50 to 55 gallons of water. Being a "by product," that is obtained incidentally in the process of making Analine dyes, it can be sold more cheaply than Paris Green, which must be manufactured directly. There is no temptation to adulterate the Purple, while the Paris Green, as ordinarily sold in country stores, is rarely pure. It should be remembered that the Purple being a compound of Arsenic, is equally poisonous, and is to be preserved and used with all the care advised for Paris Green.

"New and Rare Plants."—The Parsons Sons Co., Flushing, (L. I.) N. Y., issue a special catalogue with this title, and the contents certainly warrant it. We doubt if any establishment in Europe can show such a list of rare Japanese and other trees, shrubs, climbers, etc., both evergreen, and deciduous; several Horse Chestnuts, Maples, Oaks, Hydrangeas, Ashes, Magnolias, and others, quite new to cultivation, help make up a catalogue full of interest to every lover of choice plants.

Tying Material—Raffia.—For a long time Bass or Bast bark, was the universal tying material with gardeners and nurserymen. Large quantities of this are imported in the form of Russia or Archangel mats, which are used for packing furniture or similar articles, and are pulled apart by gardeners and others for the strands of which they are woven. Several years ago war shut off the importations of mats, and our nurserymen learned that they could prepare a better material from our native Linden or Bass-wood Tree. Cuba Bass, the inner bark of a tree of the Mallow Family, was introduced into England and to this country as a substitute for the Russian, and while it is very strong, it lacks the pliancy needed for most purposes. Lately there has been introduced from the East Indies, a material that appears to have all the good qualities of Bass without the faults of its substitutes. This is offered in our advertising columns as "Raffia," or "Raffia Fibre." It is in lengths of about 5 feet, and is about half an inch wide, but tapering gradually at one end. We take this to be derived from the stem of a species of *Cyperus* closely related to the Papyrus plant, and the same material as that from which the much esteemed India mats are made. The Raffia splits into the smallest fibres; it unites great strength with a silky softness and pliability, and for budding seems to be a most perfect tying material. How it will work in the rapid wholesale operations of the professional peach-budders, can only be told by experience.

Dentaphone and Audiphone, are names of new devices for utilizing the well-known fact that the bones, etc., of the head, can convey vibrations to the auditory nerve, and produce the sense of hearing. To many totally deaf persons these affairs are a new revelation, while those partially deaf often find great assistance from them. But those persons, in whom essential portions of the ear have been destroyed, or in whom they have been lacking from birth, are beyond the aid of these or any other appliances whatever.

The American Veterinary College.—The commencement of this excellent institution was held on February 27th last, in the presence of an audience noted for the large number of prominent scientists, merchants, and others. The graduates were 18, and represented six different States, with one from Bermuda. The customary addresses were made and prizes distributed. The occasion must have been a gratifying one to the officers and faculty of the College, and especially so to Dr. A. Liautard, its President, whose efforts in behalf of veterinary science, continued in spite of all obstacles, are now meeting deserved success. Young men who contemplate entering the medical profession will do well to consider if Veterinary Surgery does not present quite as useful a career as any other, and one more likely to be profitable.

"The Botanical Gazette."—This journal commenced its 5th volume with the present year. From small beginnings it has gone on improving and is now just such a medium as working botanists need for communicating with one another and with the world in general. The Messrs. Coulter deserve much credit for their efforts, and all botanists should aid them in what always must be a labor of love, by sending the price of subscription ($1) to J. M. Coulter, Crawfordsville, Ind.

Michigan Pomological Society.—The Report of the Secretary of this flourishing Society for 1879 comes to us full of valuable information; and especially rich in its "Portfolio" items, which the Secretary, Mr. C. W. Garfield, has selected with great care. Michigan is a good fruit State, and its Pomological Society is doing good work, as shown by the high character of its reports.

Butter Coloring is so generally used in winter, that it becomes a matter of importance to have one that, while it gives a satisfactory color, shall be free from all unpleasant odor and taste, and especially from anything unwholesome. Abundant testimony is given that the Perfected Butter Color of Wells, Richardson & Co. meets these requirements, not only by American dairymen, but in England and other parts of Europe it has met with great success and approbation.

The Robbins Family Washer.—We gave last year our opinion in full as to this Washer and the principle upon which it works, which could not have been seen by our newer readers, and those sending us numerous letters of inquiry. We can not find time to write to each one of these in detail, and we must make this general reply serve for many. The Washer acts upon the principle of the "bucking tub," so generally in use in bleacheries, etc., where immense quantities of fabric are to be cleansed, and causes a continuous stream of boiling suds to fall upon, and pass through, the clothes. If the suds is clean it will make clean clothes. If already charged with the soiling material from very dirty clothes, it will not make but slightly soiled ones cleaner. Used with common sense and judgment, it can be a great help in washing. Left to those who have neither sense nor judgment, and who have a natural prejudice against whatever is different from that to which they have heretofore been used, such people will contrive to make it a failure.

Draining, and the Reasons Why.—Sometimes a catalogue or price-list is much more than it pretends to be. An instance of this is presented in a price-list of only four pages, by Wm. M. Bell, Smyrna, Del. The description of the tiles made and the prices at which they are sold occupy but a small space, while the rest is occupied by a condensed, well put treatise showing why people should drain, and telling how it should be done—whether to increase the crops of the farm or to promote the health of the family of the farmer.

A New Work on Peach Culture.—Mr. John Rutter, a skilled Nurseryman and Fruit Grower, of West Chester, Pa., has just published a small work on the Culture and Diseases of the Peach. The Author claims that peaches may be successfully and profitably grown, outside of the few localities heretofore regarded as especially "Peach Districts," and that the failures from "Yellows," and other diseases, are due to bad culture, or rather want of culture. He gives in a plain and unassuming style, the methods that he has found so successful himself, that he commends them to others. We trust that the work may be the means of greatly extending the culture of this favorite fruit.

"Forty Years' Experience in Pear Growing," by William Parry, of Cinnaminson, N. J., is the title of a pamphlet of 20 pages, mainly filled by an address given by Mr. Parry, before the N. J. Horticultural Society. Much space is given to the Kieffer, and other new pears that are regarded as hybrids, between the Chinese Sand Pear, and our cultivated varieties, and of which Mr. Parry has strong hopes. The Author presents an excellent portrait of himself with the work, which will cause people to think that he must have begun pear culture at a very early age, in order to have gained 40 years of experience.

A Slight Omission, but an important one. Some one writes to inquire if a certain paper has stopped, as he can get no answer to the letters he has written to the office. If the letters sent to the other paper were like the one to us, it would be rather difficult for him to get an answer, as he gives neither town, city, or State.

Just How.—A correspondent wishes to know if we can not give an article that will tell him "just how" to prune his grape-vine. We could not do this without an exact diagram of the vine as it now is, and such directions for pruning this would be of no use as a guide for any other vine or for the same vine next year. The growth of the vine is according to a few simple laws, and one to prune a vine properly, must, in the first place, have a definite idea of what he wants to do with it; then keeping in mind the manner in which he can do it in accordance with the laws governing the growth. There is no way of removing the necessity for thinking.

"The American Entomologist."—When Prof. C. V. Riley, nine years ago, found it necessary to suspend for a while the publication of this Journal, the fact was regretted by all interested in Entomology, whether in its scientific aspects or in its relation to Agriculture and Horticulture. That its publication, after an unexpectedly long interim, has been resumed, will equally interest the same persons we may feel sure, but the appearance of the Journal should be welcomed by that large number who, during its suspension, have become interested in Entomology as a science or as an important part of a cultivator's knowledge. The Journal re-appears with its former mechanical form. Its editorial force has been strengthened by the addition of Mr. A. S. Fuller, who brings valuable aid to Prof. Riley. The Journal promises to be, as it formerly was, not merely the organ of scientific entomologists, but one which the fruit-grower and cultivator generally can not well do without. The same prominence, as before, is given to the practical aspect of the science, and the Journal is one worthy of abundant support. This time the Journal is published in N. Y. City by the "Hub Publishing Company," No. 323 Pearl St., to whom subscriptions ($2.00 per annum) may be sent.

Peanuts in California, are chiefly grown in eleven counties. The total number of acres is 436, with a yield of a trifle over a thousand pounds per acre.

Weaning Calves.—"L. E. B." The method of weaning calves by means of an artificial teat in the bottom of a pail, is very simple. All that is needed is to make a mold of elder wood, and cover it with soft leather or rubber tubing, and fasten this to the bottom of a pail. A sufficient opening must be made in the bottom of the tube to let in the milk, when the calf sucks the upper part.

Farm Wages.—The official reports show that with few exceptions the price paid for farm labor in the various States of the Union was 3 to 15 per cent lower during 1879 than the previous year. In New England, for example, the average rate was $20.31 against $22.60 for 1878. The decline in the cost of living has been in about the same ratio. In Minnesota, California, and other States and Territories in the Northwest, wages have been an exception to the rule throughout the East. As the wages have increased in the Pacific States, so has the cost of living in a much greater ratio. The English agricultural laborer receives on an average $15.60 per month and that without board and lodging. In Ireland, Italy, Spain, and France, it is 5 to 12 per cent less than in England. In view of this the American farm laborer getting $1[illegible] and board for eight months, and in many cases for the whole year, is doing well.

A Modern State Fair: Graphic Description.—Gov. Furnas, of Nebraska, must have been traveling eastward, for it seems hardly credible that his graphic picture, and unfortunately a too true one of *some* cases, could have been inspired by anything that would be allowed by the good people of Nebraska.... "Bands of Music, Dance Halls, Horse-races, Mule-races, Slow-races, Foot-races, Sack-races, Balloon Ascensions, Greased Pigs, Greased Poles, Wheels of Fortune, Rocking Swings, Tight-rope Performances, Female Pedestrians, all manner of Venders, from the Peanut Stands, *ad infinitum*, together with numberless nameless incidents, *et hoc genus omne*—all securing a crowd, good times, large gate receipts, and enabling the Board to 'pay out.'"

Carp Culture in California.—A correspondent of the "Pacific Rural Press," gives his experience in the culture of the carp, which, to say the least, is very satisfactory to him, and encouraging to all who may desire to grow this kind of food. In January, 1876, he bought six carp, one of which soon died. The first year he raised 2,044, and in 1877, 2,672, from the same five fish. In 1878, he disposed of two of the old fish and reared 4,000 from the remaining three. The crop for 1879 has not yet been put into figures. The four fish ponds cost $50 each; first cost of fish $30; food $10; total, $240. He has sold $415 worth of fish, and has from 6,000 to 8,000 carp in his ponds, besides his family has been eating carp for the past 18 months. The ground devoted to this industry, that is, the area covered by the ponds, etc., is about a half acre; and it is to be remembered that it was wet, waste, and otherwise comparatively worthless land at that.

Peaches for New England.—We are glad to hear of the planting of peach orchards in places where their culture was long ago abandoned; in Eastern New York and Northern New Jersey peach culture has taken a new start, and recently several inquiries come from New England. One obstacle to peach culture is the common notion that a peach tree should last an ordinary life time. In some peach districts they are content if they get two good crops in five years. Trees are exceedingly cheap, and when one planting shows signs of failing, set out another. Our New England correspondent asks for a list of about six varieties suited for market for Eastern Massachusetts. As to varieties nearly every place has one or more local varieties that succeed better than almost any others. For early varieties, Hale's Early, in many places rots so badly just at ripening, as to be useless. Waterloo, Amsden, and a number of other new very early kinds are offered, and seem worthy of trial. One planting for market should look into the merits of these. For six established varieties: Early York, Crawford's Early, Cooledge's Favorite, Old Mixon Freestone, Crawford's Late, Ward's Late Free; also Morris' White.

Sale of Stock by Weight.—Dr. J. B. Lawes, in a recent number of the "Mark Lane Express" stands up strongly in favor of using the scales in all sales of live stock. There is enough uncertainty in the farmer's occupation which cannot be avoided; but the guess-work and the great amount of time spent in making rough estimates, should be superseded by the quick and satisfactory method of actual weighing.

Experience with Canada Thistles.—F. Bacon writes from Lake Co., Ill., essentially as follows: "Eleven years ago I bought my present farm, and upon it was a patch of Canada Thistles covering about 1¼ acre of land, bordering on a slough. It was so boggy and rough that it was impossible to mow them, even with a scythe, so they had yearly to be cut with hoe or spade, making the job an expensive one. Having the slough first well drained, I plowed the piece—through the summer of 1878—plowed, harrowed, or cultivated, every time a green plant appeared. On the first part of Sept. I gave the field a thorough plowing, harrowing, and rolling, and sowed broadcast, by hand, 2½ bushels of winter wheat. Having just threshed, I give the result, which was 81 bushels machine measure, weighing 66 lbs. to the bushel. I had one load of rakings that was threshed with spring wheat, that I have no doubt would have made 5 to 8 bushels more. Every part of it was lodged, and consequently there was a great deal left on the ground. I have no doubt that there were 100 bushels grown on the ground, and not a thistle has been seen since." But was this really the "Canada Thistle?" The ease with which it was subdued makes us suspect that it may have been some other thistle.

Shrinkage in Hogs.—A western farmer, to determine the amount of loss of weight in killing and dressing hogs, selected twenty hogs that had been fed in the average way, on corn, etc., and weighing about 150 pounds. The shrinkage in this experiment was a trifle over one-seventh of the live weight. The loss from the flow of blood in "sticking" was determined in two cases, namely, 8 and 7¼ pounds. But the breed has much to do with all this, and such statistics, to be of value, should state the breed of the animals.

A Wood Shed is a necessary part of every economical farmer's home. It does not cost much in its construction; is a great convenience in keeping the wood dry, and furnishes a shelter in which much, if not all the work, of preparing the wood for the stove can be done in stormy weather in winter and the rainy days of summer.

Cure for Cribber.—"H. J. S.," Fisher's Ferry, Pa. The most effective remedy for a cribber, is to cause the horse to wear the cribbing muzzle, described in the *American Agriculturist* for July, 1875. This does not prevent eating or drinking, but the horse cannot take hold of his crib, or a post, with his teeth.

North Carolina.—We have on a former occasion commended the enterprise of Mr. Geo. Allen, Seedsman, of Newbern, in distributing the *American Agriculturist*, and in otherwise aiding the farmers of his State. He now publishes a bulletin, in which he gives "Fifteen Reasons for Emigrating to North Carolina," and other useful items.

To Raise a Roof.—"R. M. C.," Washington, Pa. It is an easy matter to raise the roof of a building so as to build an extra wall under it. Loosen the plates from the wall and raise the roof, one corner at a time, resting the roof on timbers placed across the corners of the building. As the roof is raised build up the wall, and as this is done, raise the roof. If the building is a frame one, the roof must be raised the intended hight first, resting on blocks placed on the floor under it; and the studding spliced and mortised into the plate. The raising may be done by levers, a little at a time, or by jack-screws. But it should be secured as it is carried up, so that it cannot go over sidewise.

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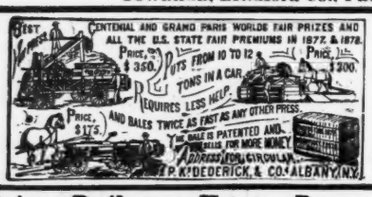
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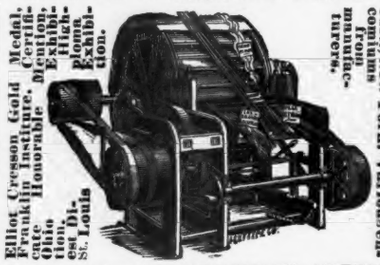
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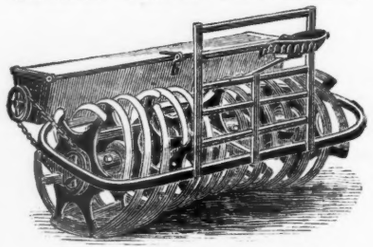

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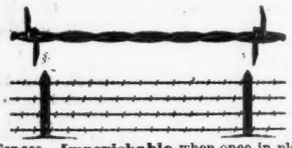

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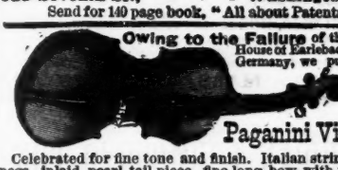

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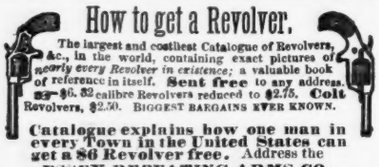

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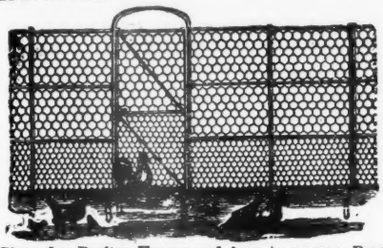

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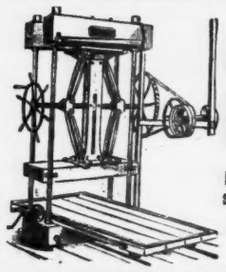

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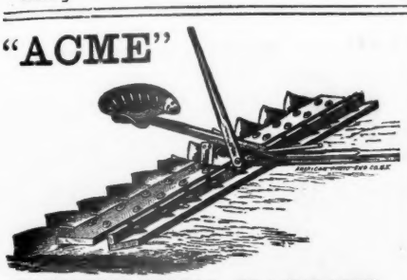

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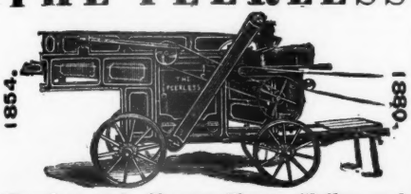

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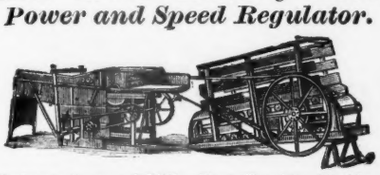

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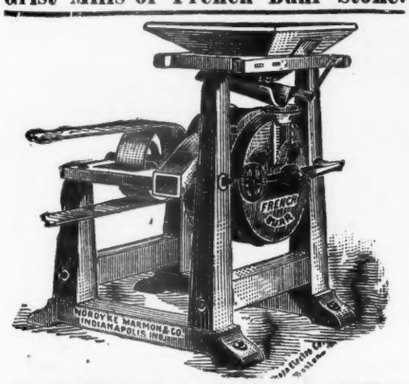

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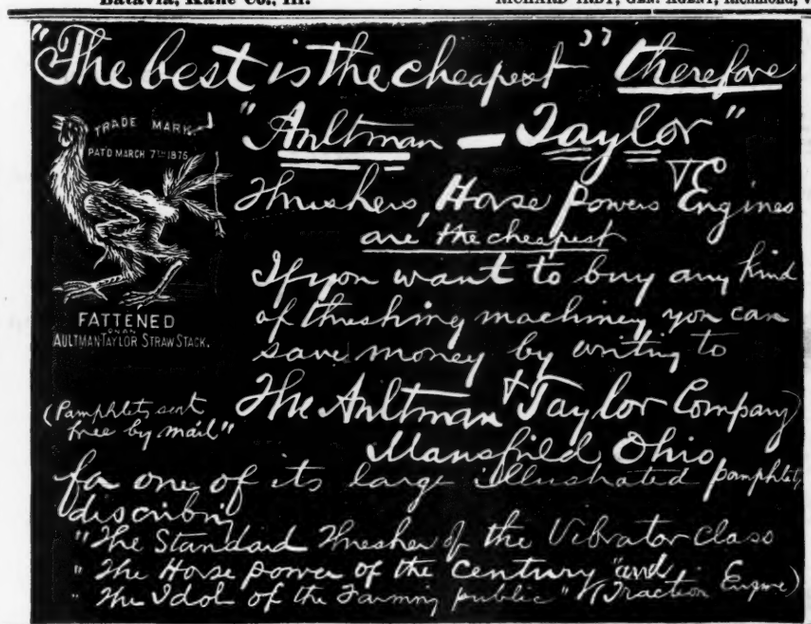
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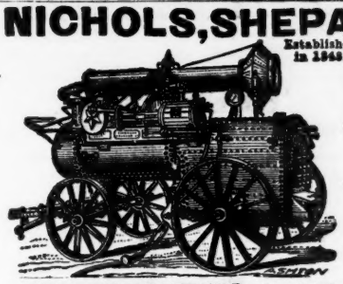

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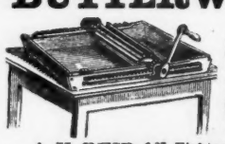

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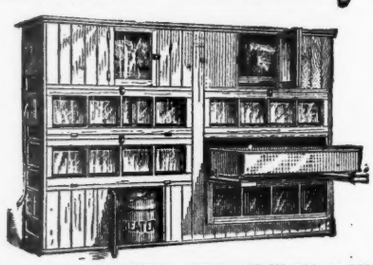

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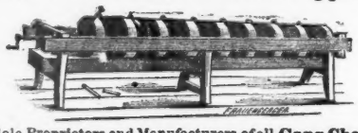

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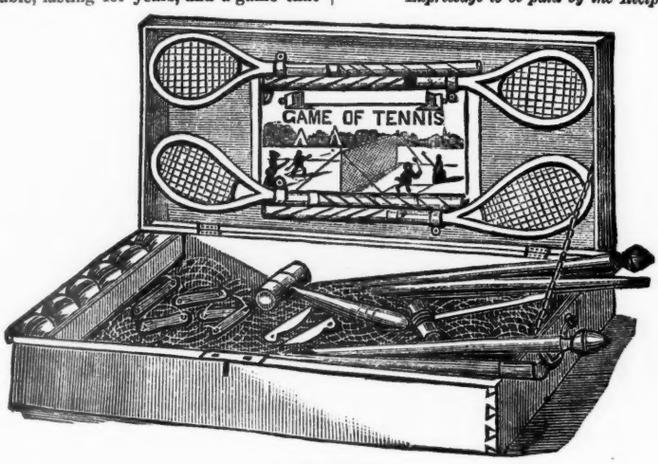
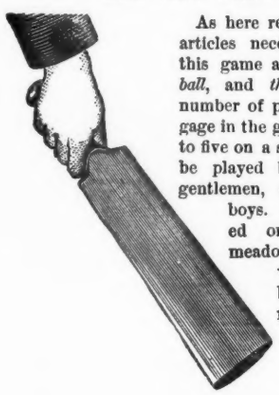
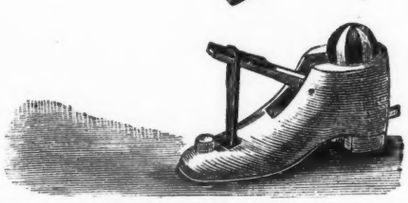


LAWN TENNIS.

BAT AND TRAP.



As here represented, the articles necessary to play this game are *one bat, one ball,* and *the trap.* Any number of persons can engage in the game, from one to five on a side, and it can be played by ladies and gentlemen, or girls and boys. It can be played on the lawn, meadow, or any place where base-ball, lawn tennis, or croquet



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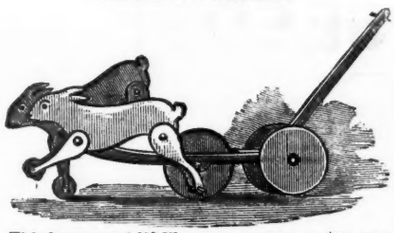

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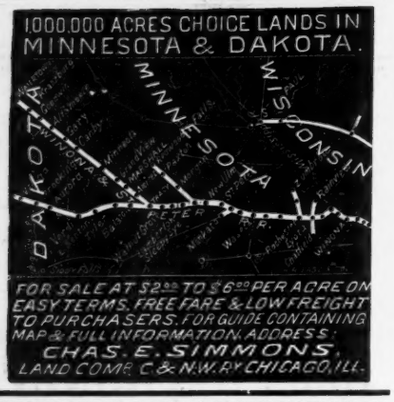
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